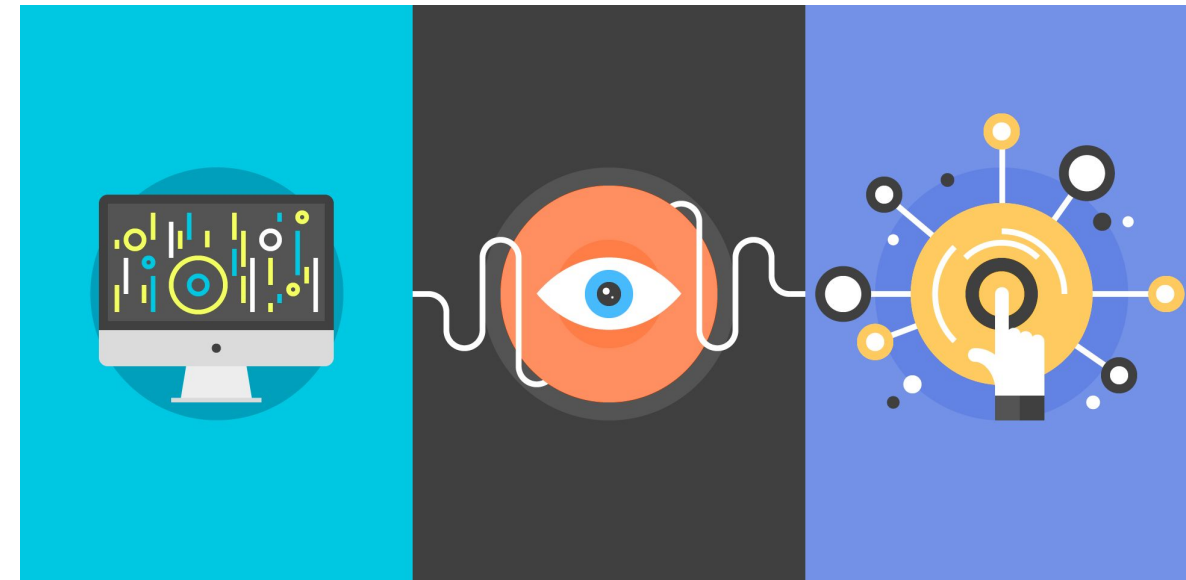
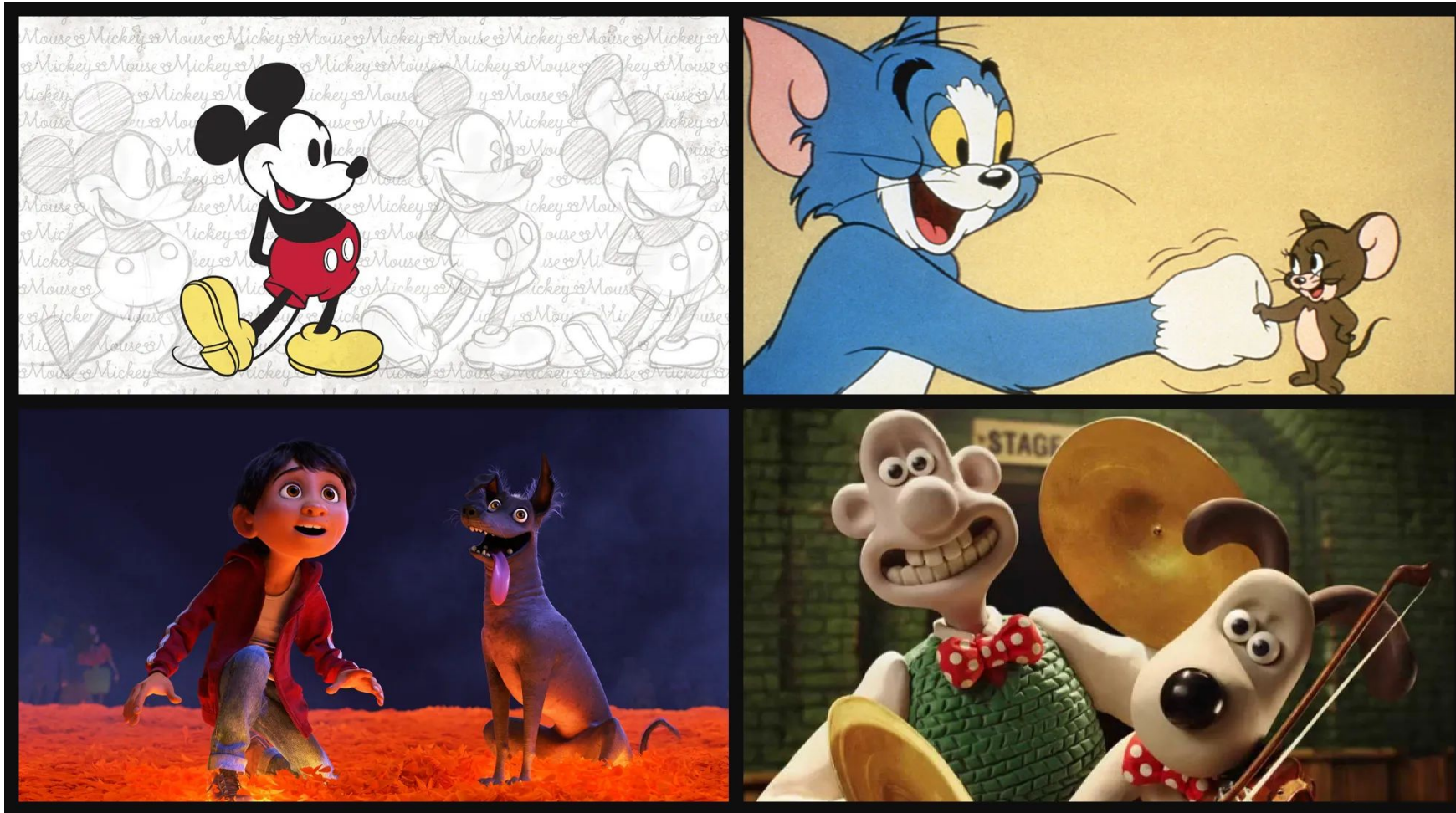
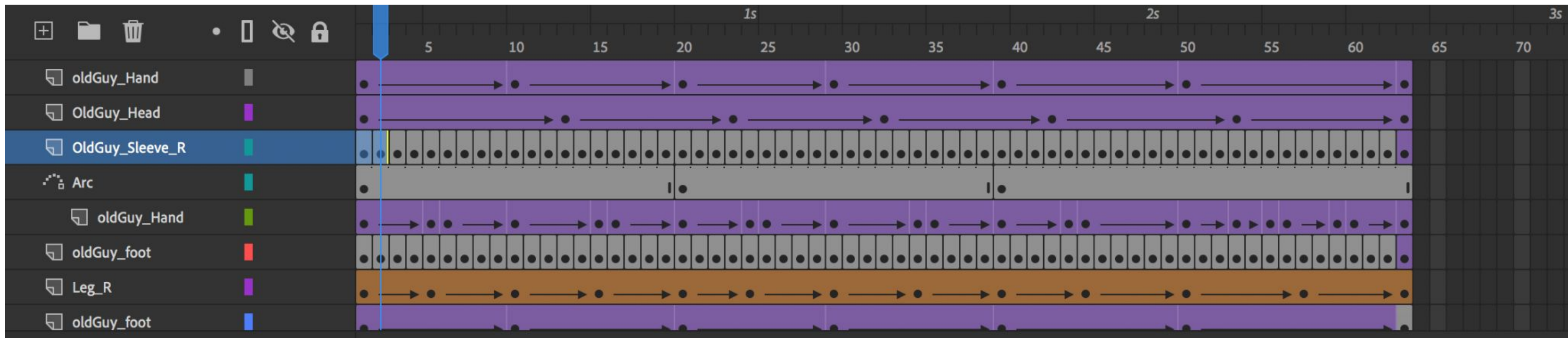


# O que é animação?

---



# Conceitos Gerais de Animação (CGA) - Linha do tempo





# CGA - Quadros por segundo

---

12 FPS



60 FPS



24 FPS



# CGA - Quadros por segundo

---





# CGA - 1s, 2s e 3s

---

24 FRAMES	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1s	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2s	●		●		●		●		●		●		●		●		●		●		●		●
3s	●			●			●			●			●			●			●			●	

# CGA - 1s, 2s e 3s

---

It is all the same frame rate , 24 FPS  
but the number of drawings per second  
makes a big difference in the look of the animation



**Animation 'ON ONES'**  
**(24 drawings per second)**  
**running at 24 FPS**



R1



# CGA - 1s, 2s e 3s

---



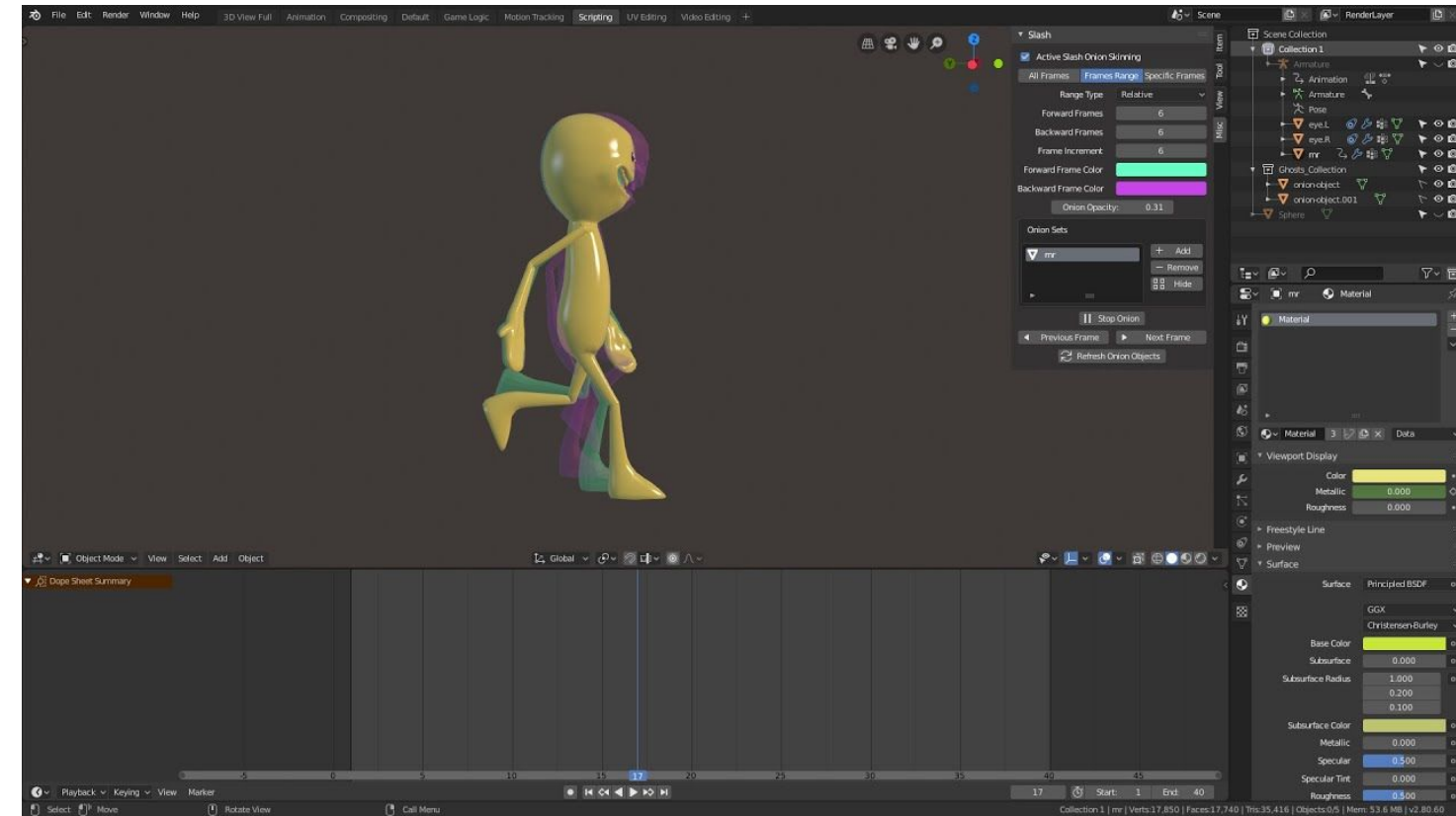
# CGA - Menos frames ainda?

---

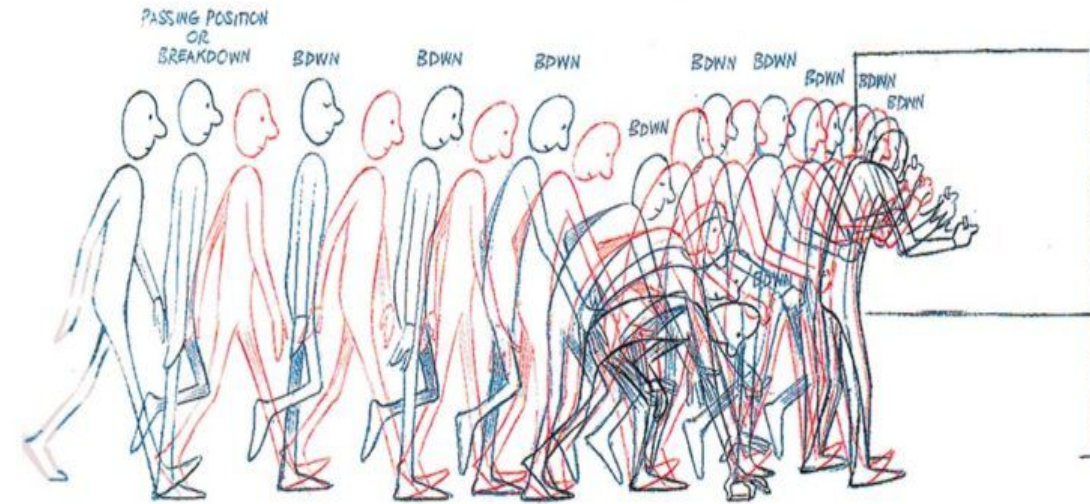
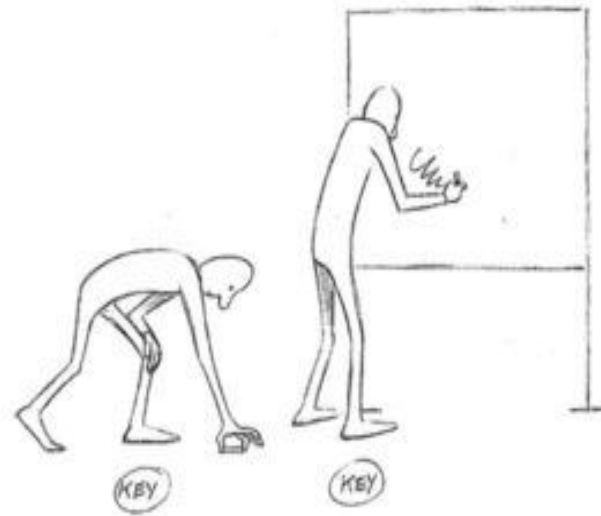




# CGA - Onion Skinning (Camadas)

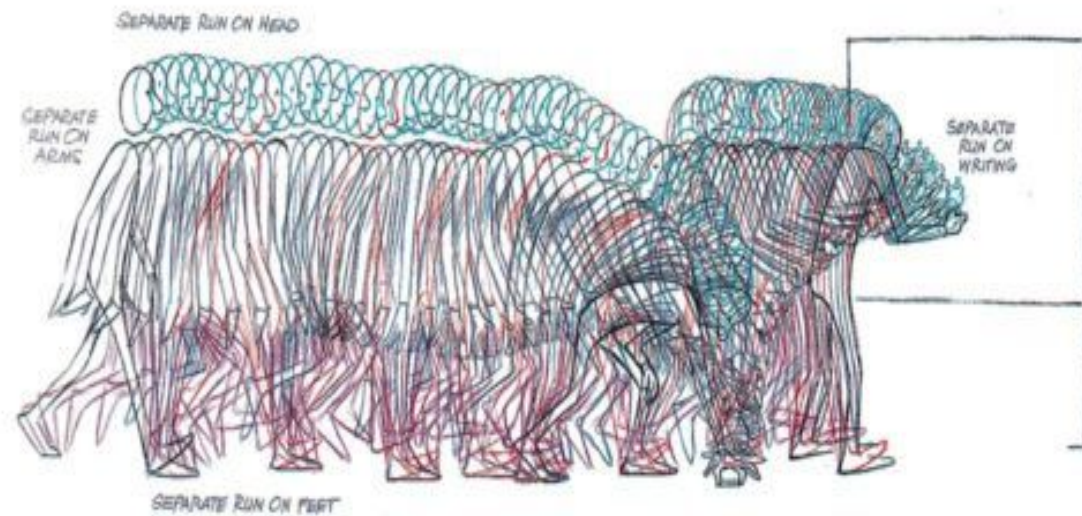


# CGA - Terminologia - Keyframes/Breakdowns/Inbetweens



Keyframes

Breakdowns/Secundários

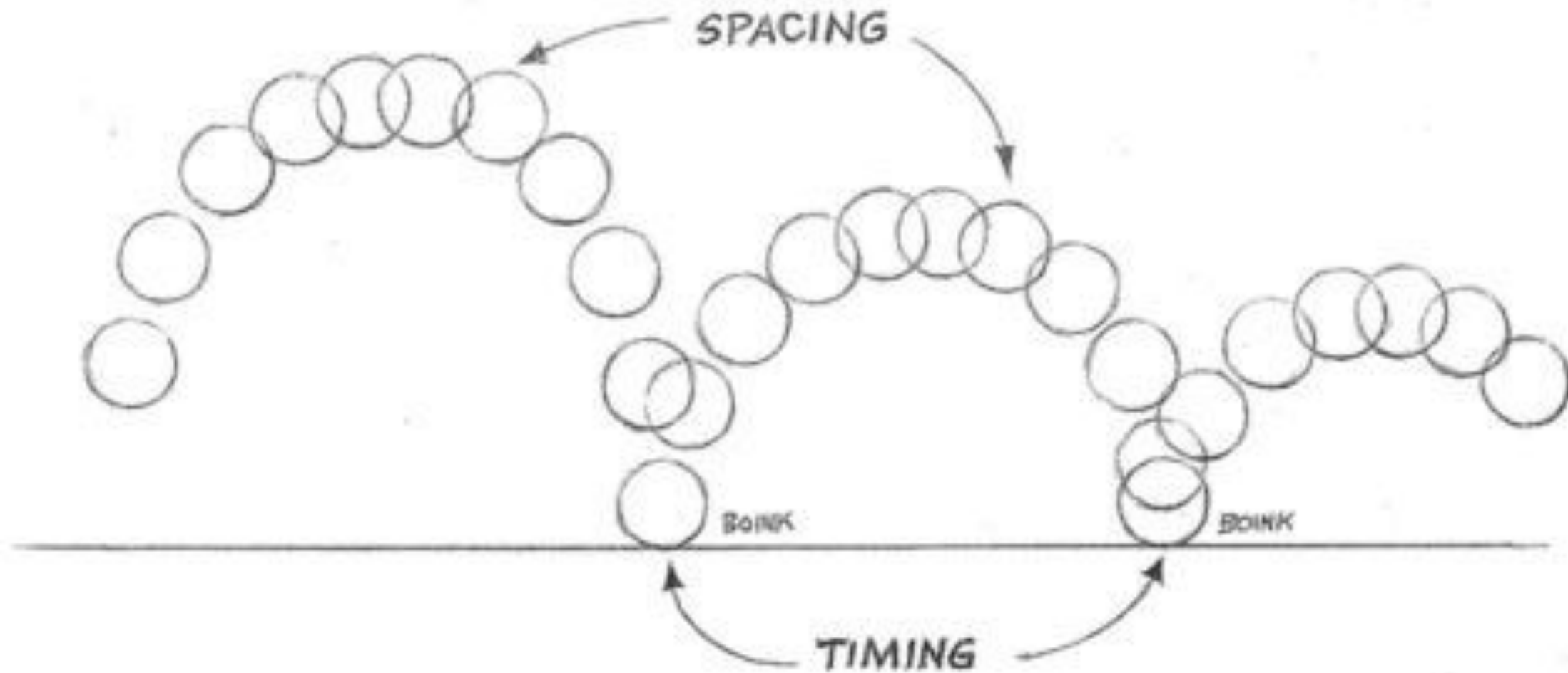


Inbetweens



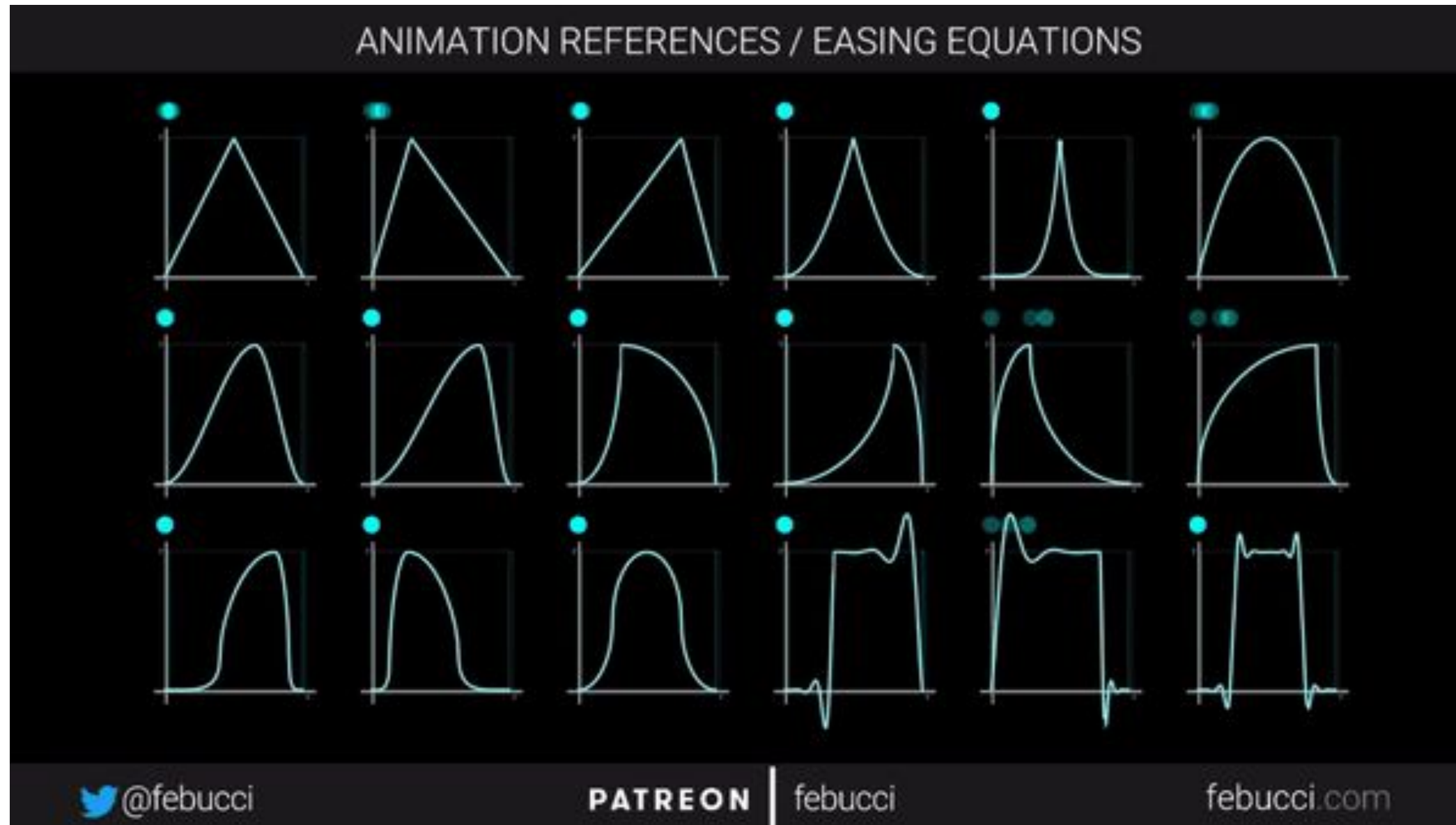
# CGA - Terminologia - Spacing e Timing

---



# CGA - Terminologia - Easing

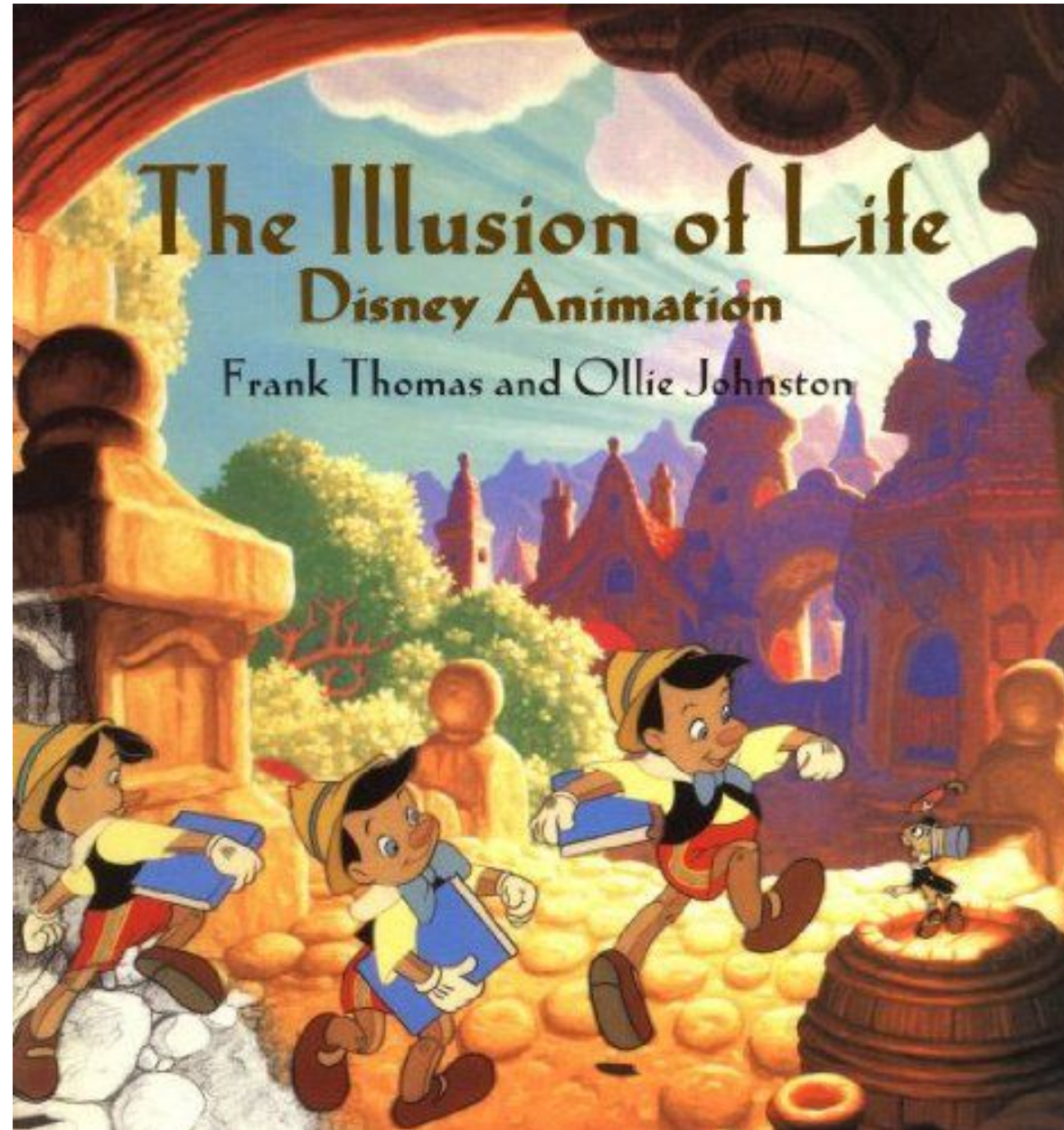
---





# CGA - Os 12 princípios da animação

---



# CGA - Os 12 princípios da animação

---

#1  
SQUASH & STRETCH

#2  
ANTICIPATION

#3  
STAGING

#4  
STRAIGHT AHEAD & POSE TO POSE

# CGA - Os 12 princípios da animação

---

#5  
FOLLOW THROUGH & OVERLAPPING

#7  
ARCS

#6  
SLOW IN & SLOW OUT

#8  
SECONDARY ACTION



# CGA - Os 12 princípios da animação

---

#9  
TIMING

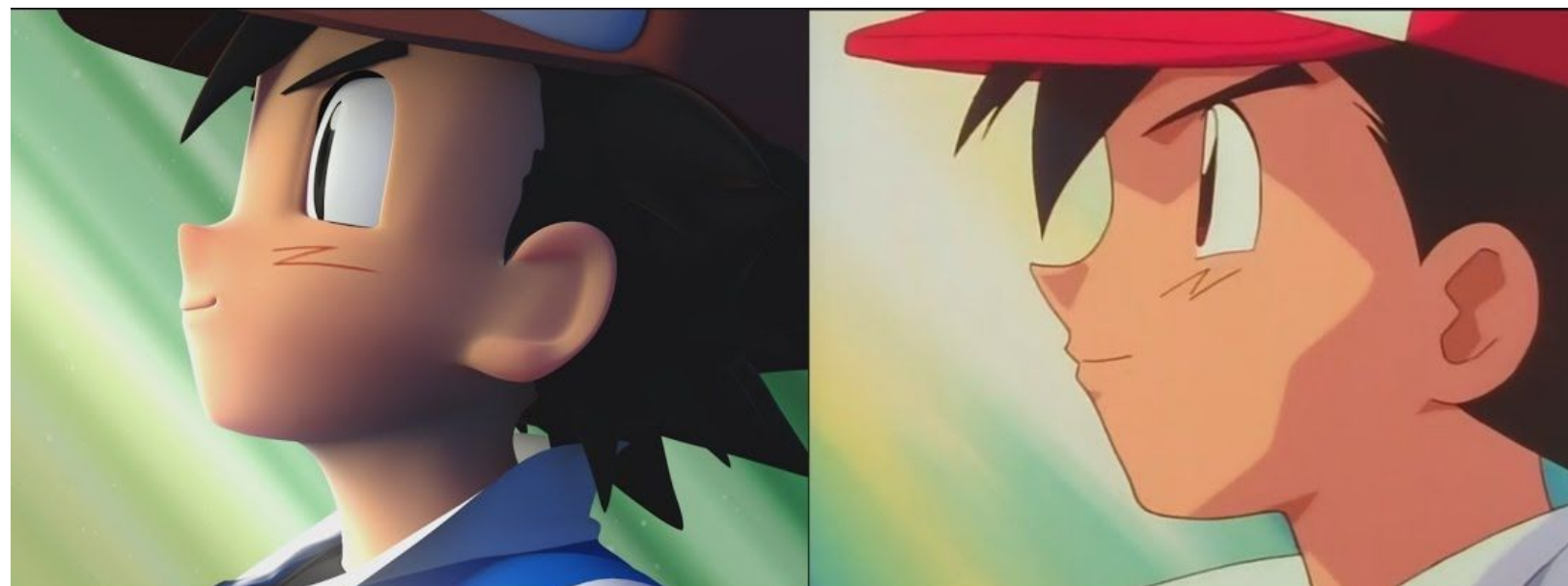
#11  
SOLID DRAWINGS

#10  
EXAGGERATION

#12  
APPEAL

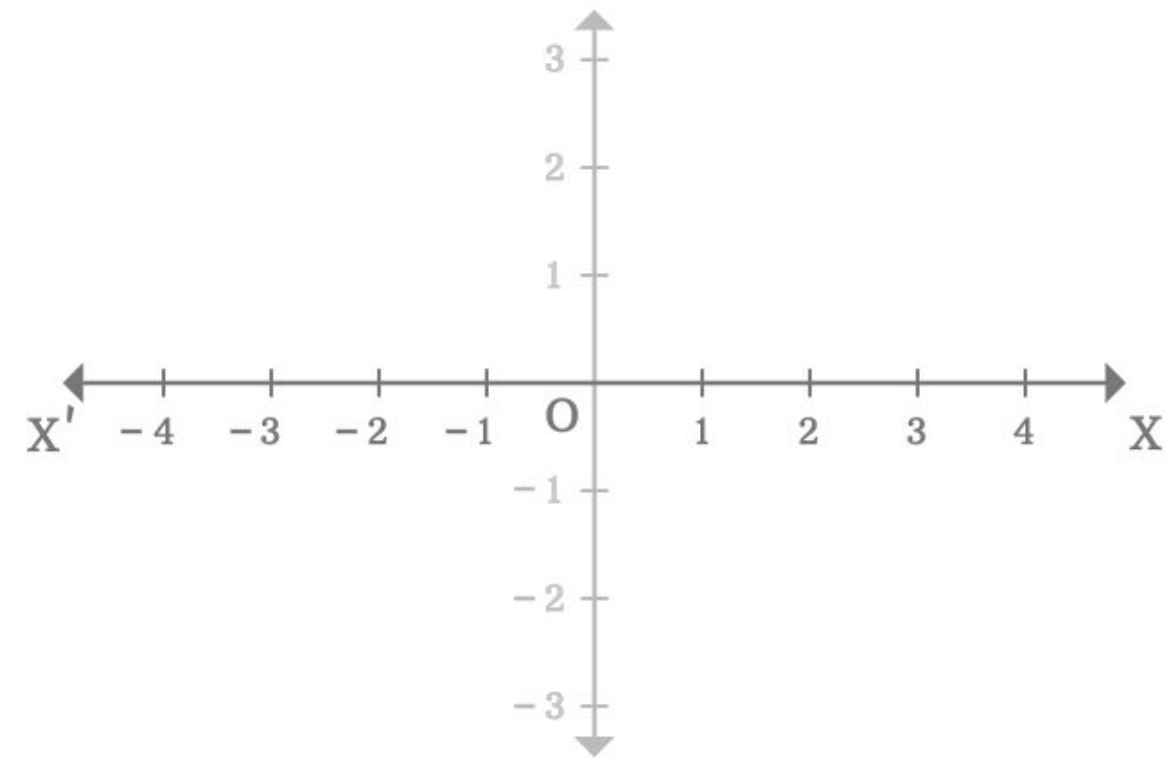
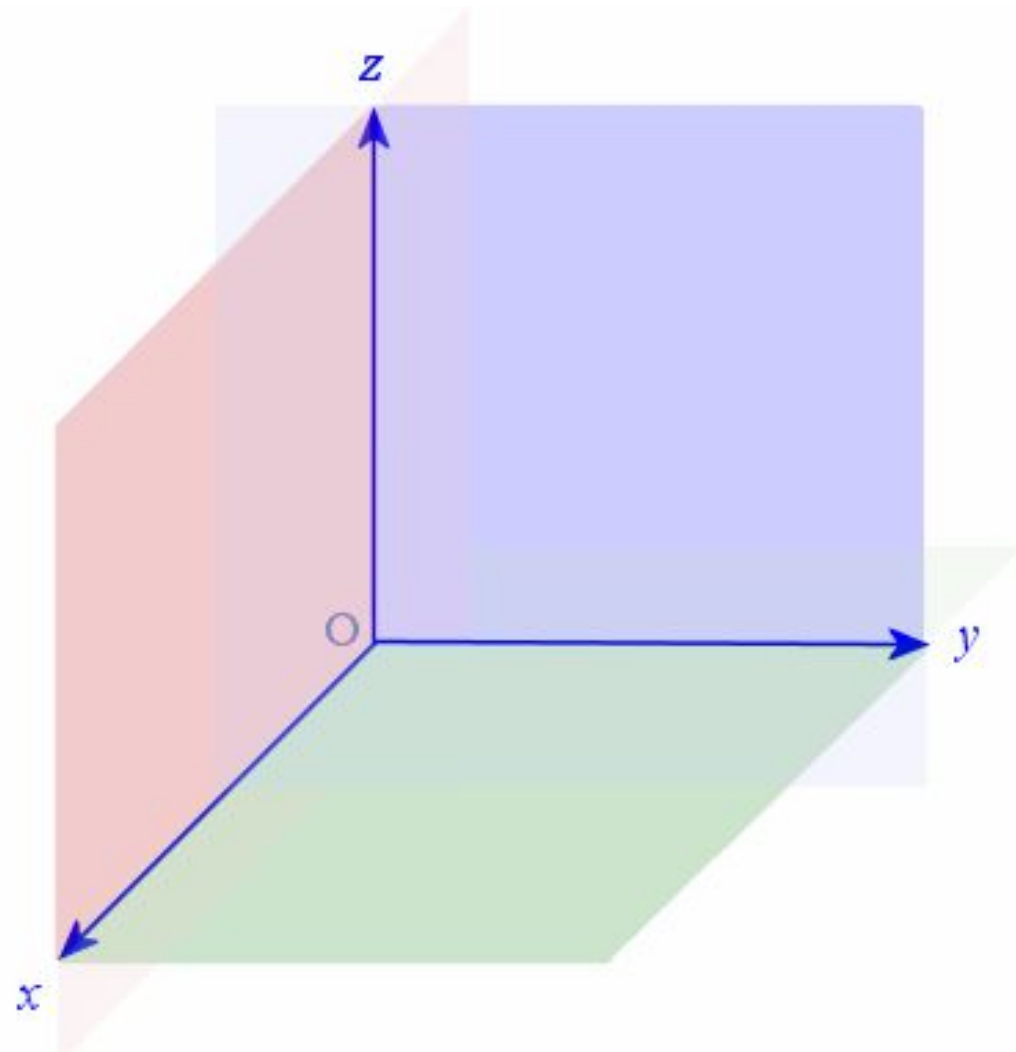
# 2D x 3D

---



# 2D x 3D - Uma visão superficial

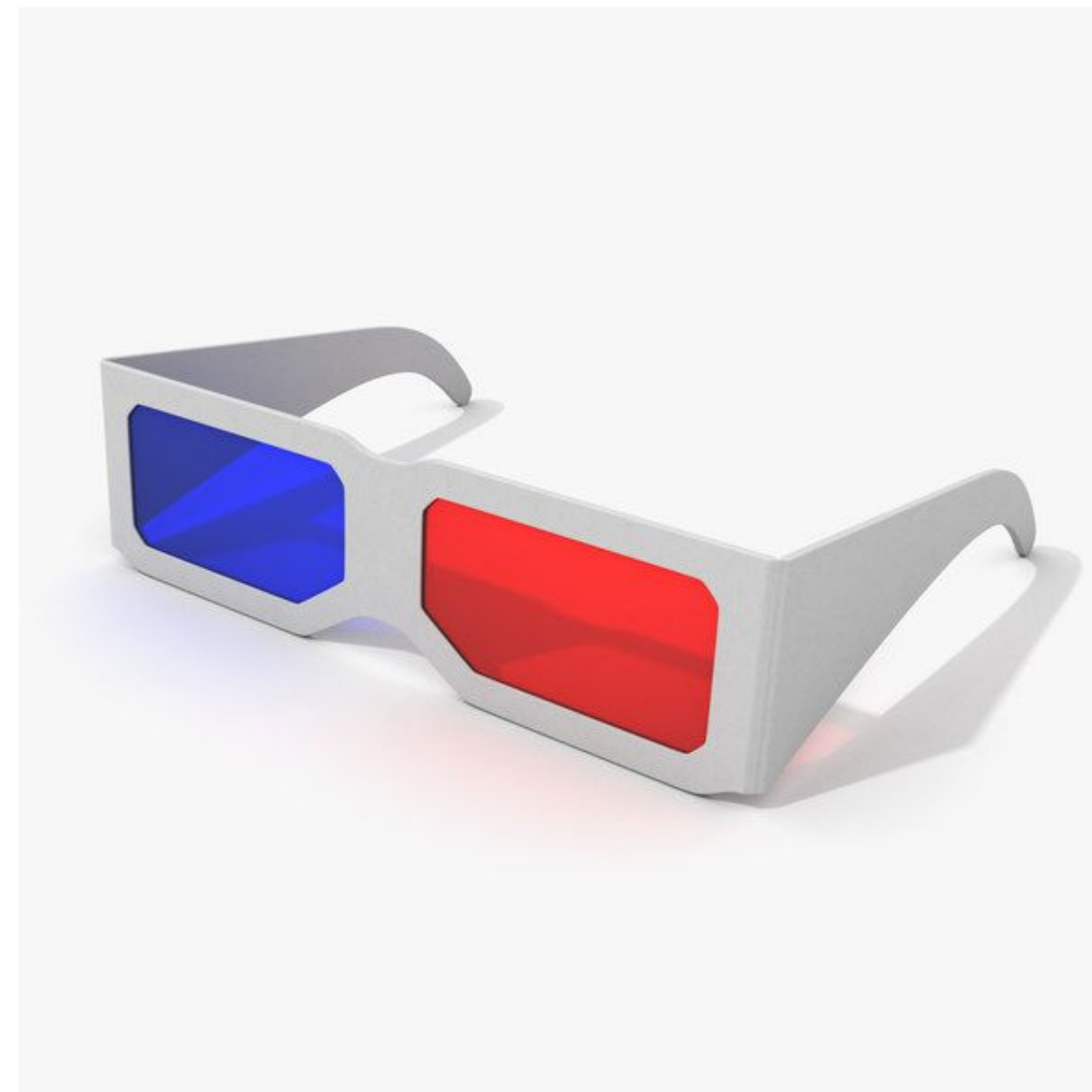
---





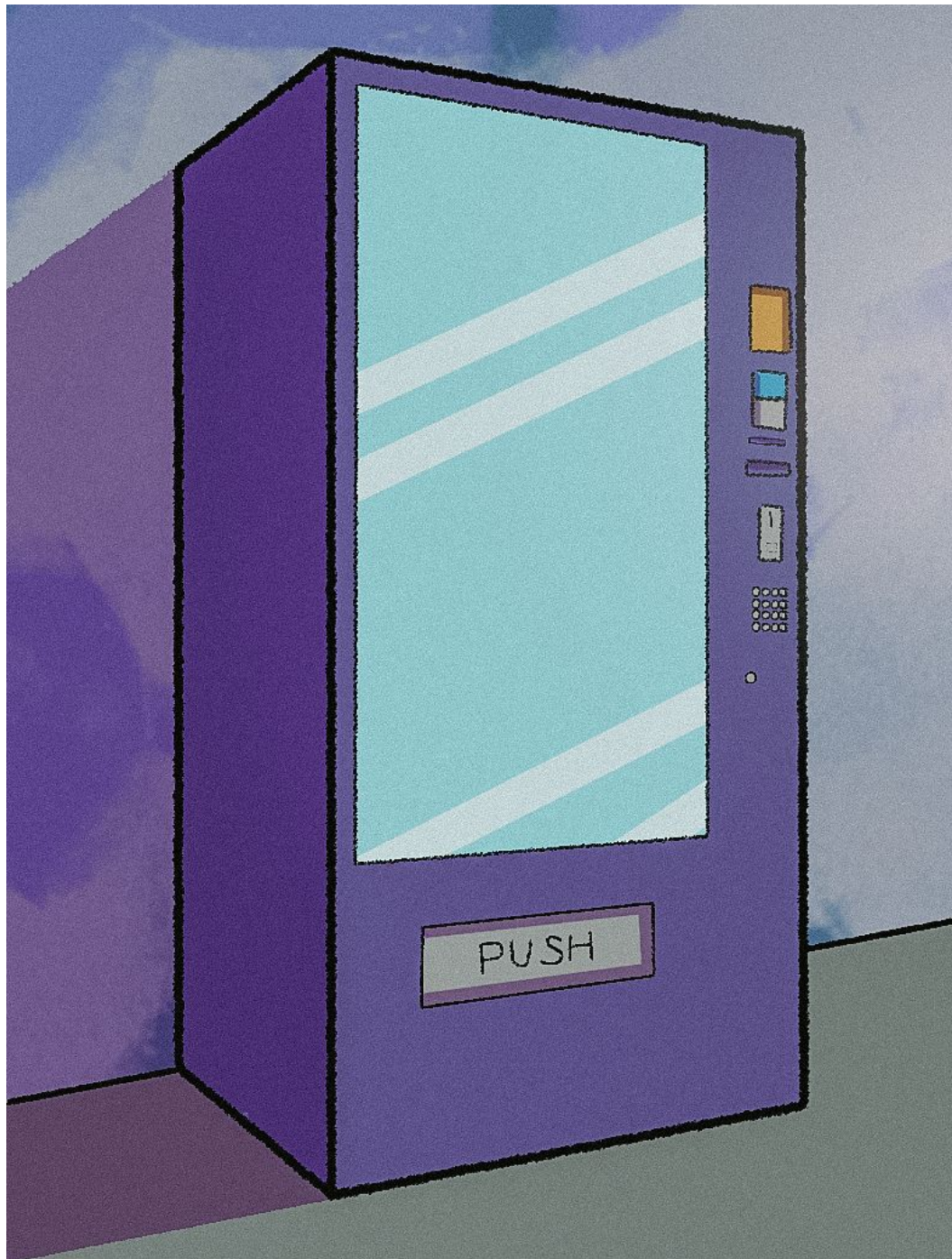
# 2D x 3D - Uma visão superficial

---





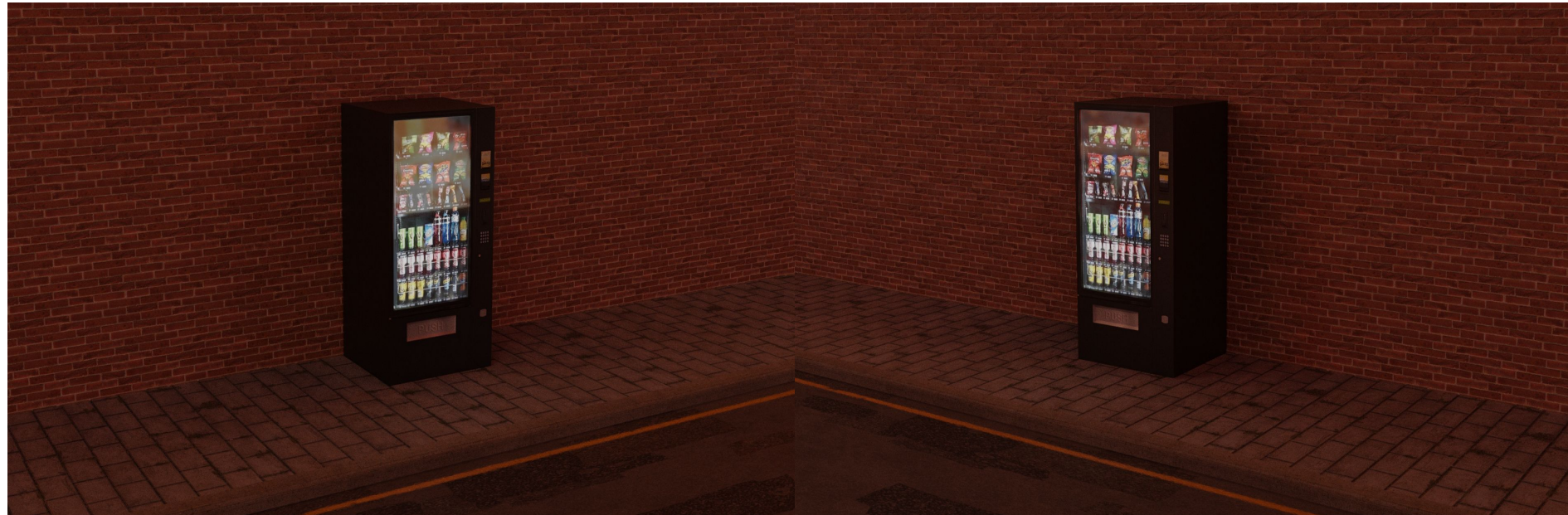
# 2D x 3D - Uma visão prática





# 2D x 3D - Uma visão prática

---





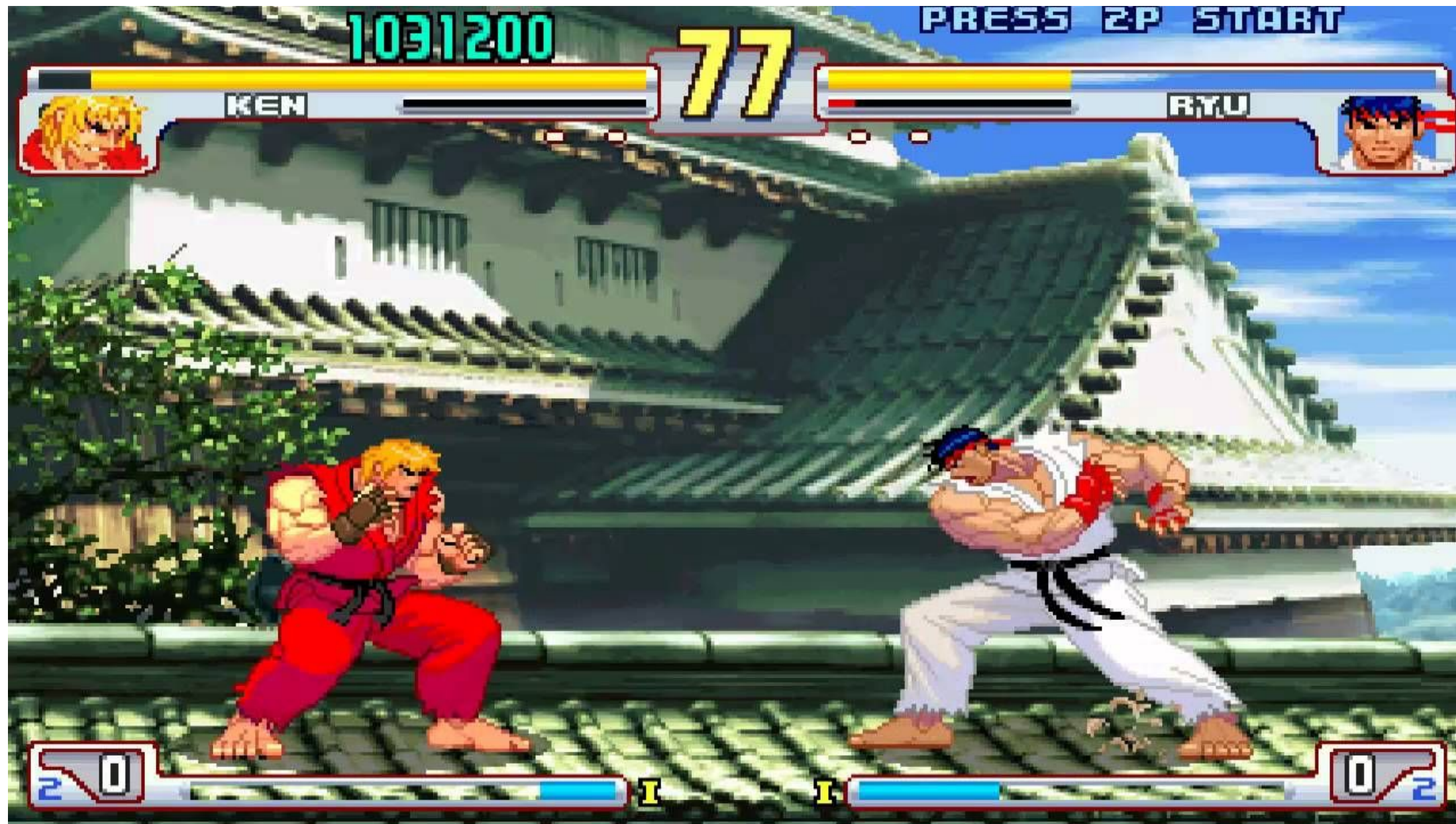
# 2D x 3D - Uma visão prática

---





# 2D x 3D - Uma visão funcional



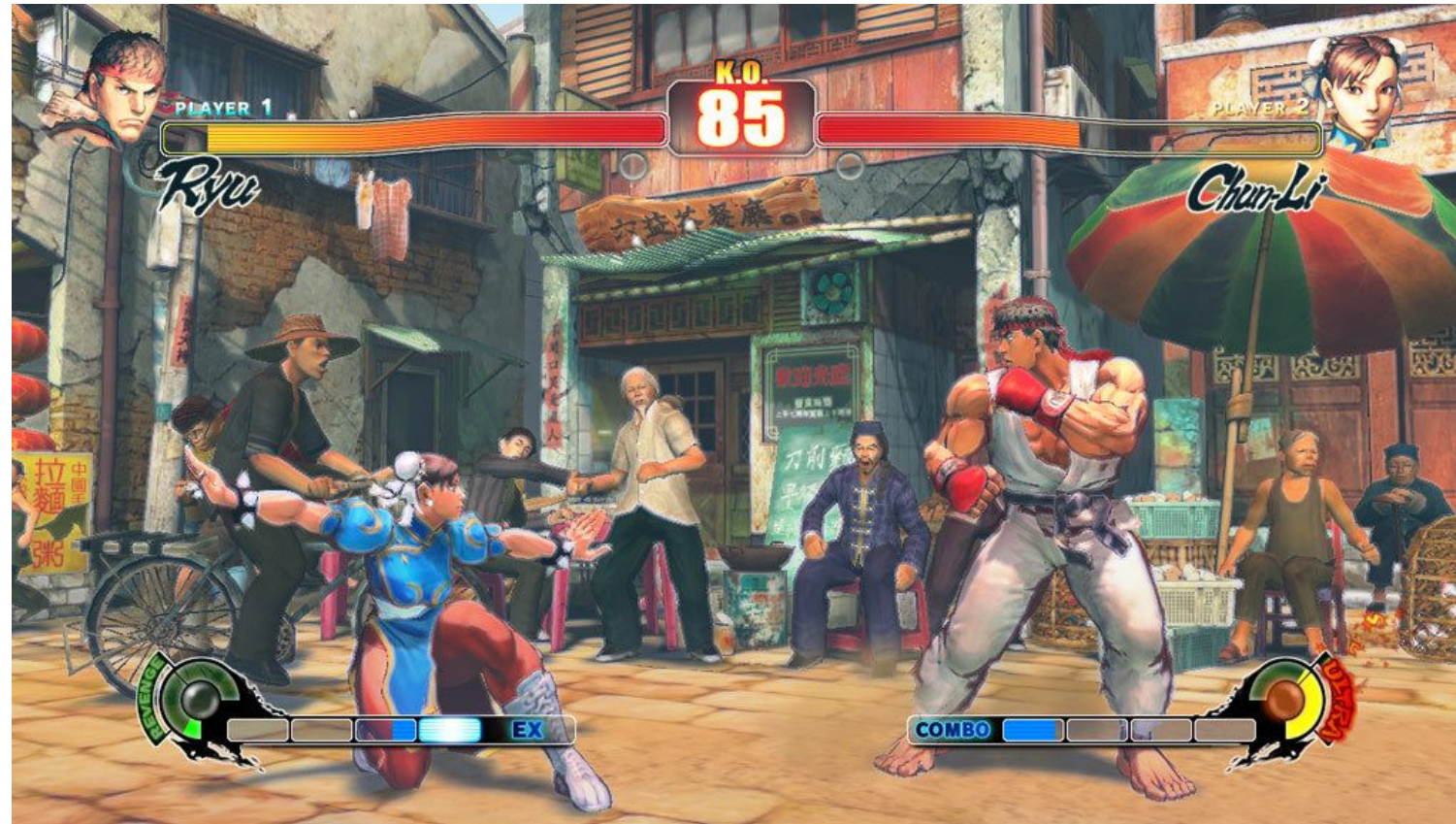


# 2D x 3D - Uma visão funcional





# 2D x 3D - Uma visão funcional



2D



3D



# 2D x 3D - Uma visão funcional



**2D**



**3D**



# 2D x 3D - Uma visão funcional



3D



3D



# 2D x 3D - Uma visão criativa

---





# 2D x 3D - Uma visão criativa

---



# 2D x 3D - Uma visão criativa

---





# 2D x 3D - Qual a visão?





# 2D x 3D - Qual a visão?





# 2D x 3D - Qual a visão?

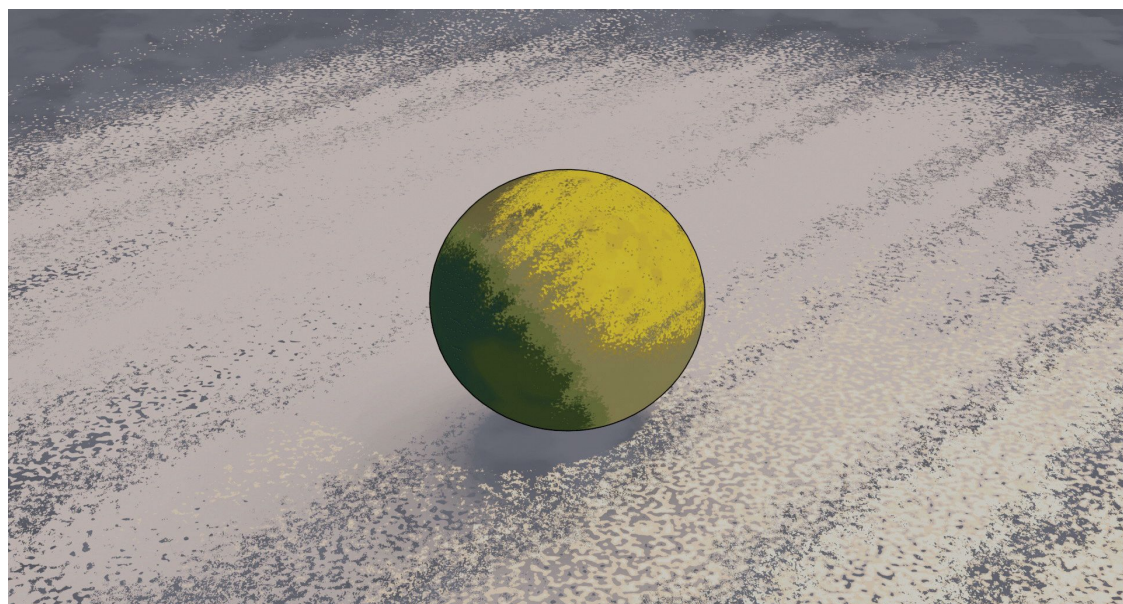
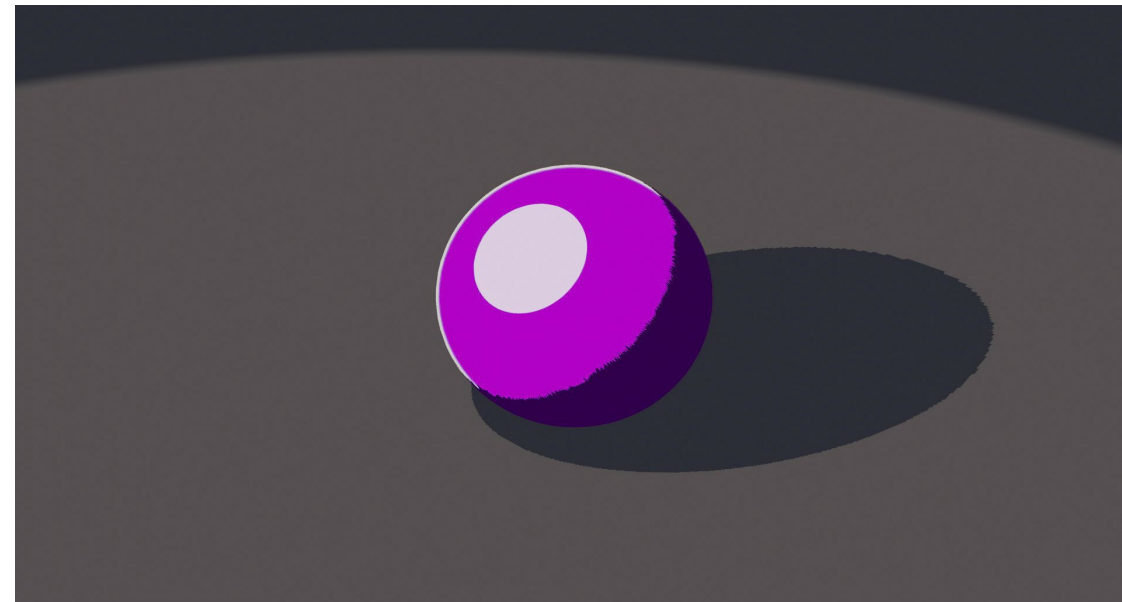
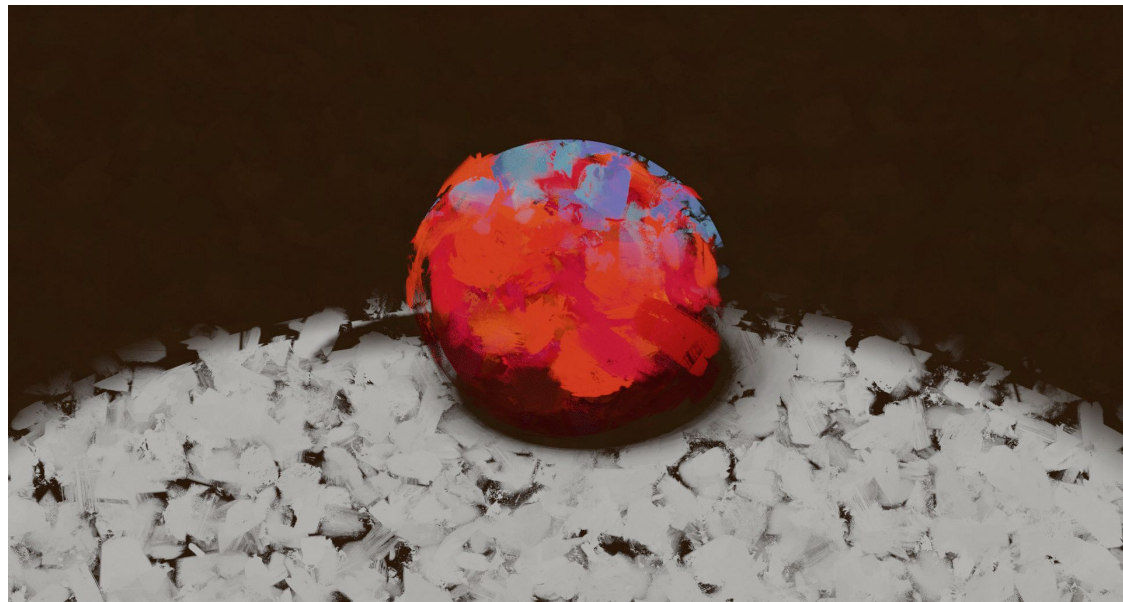
---





# 2D x 3D - Qual a visão?

---



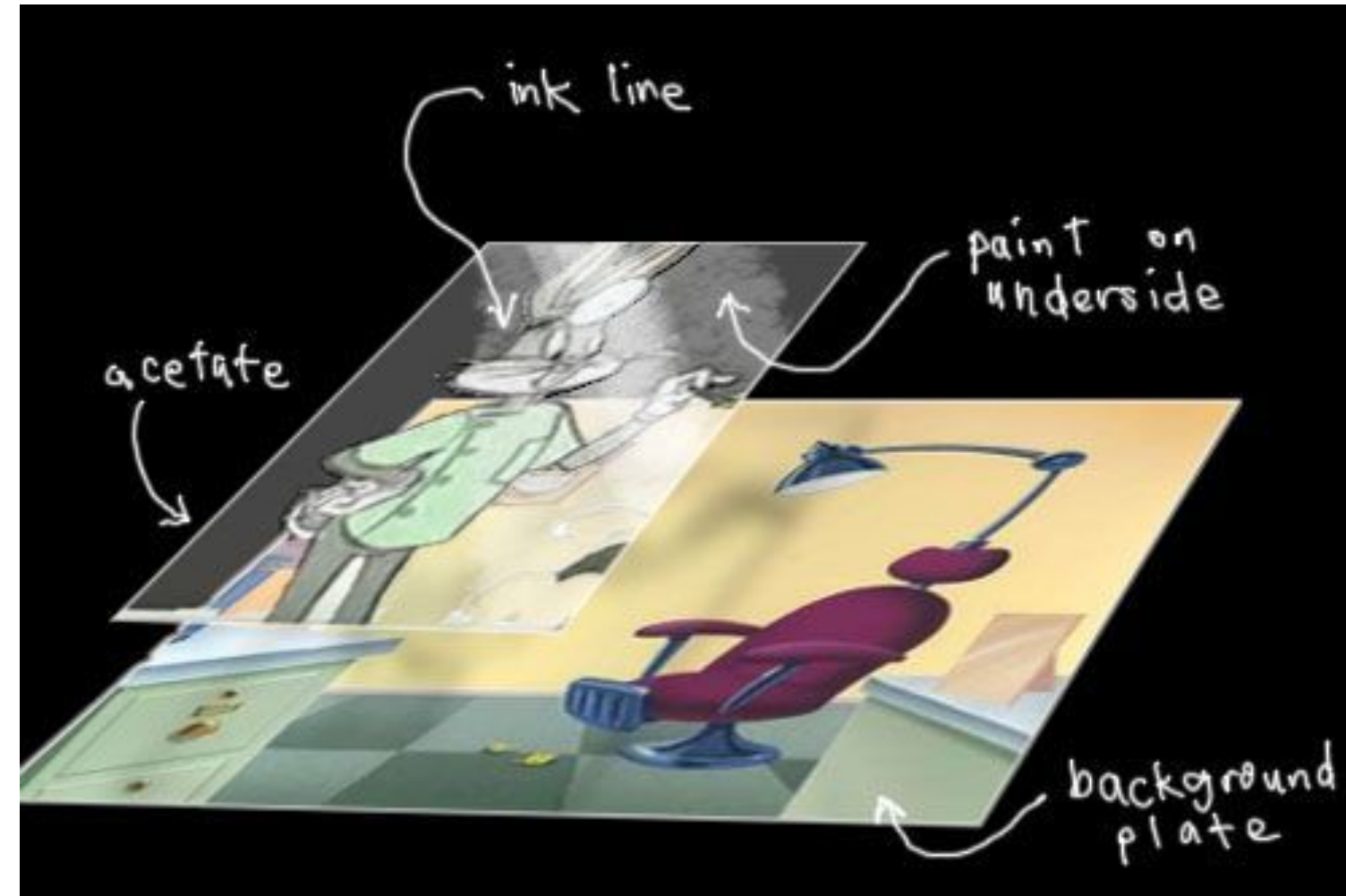
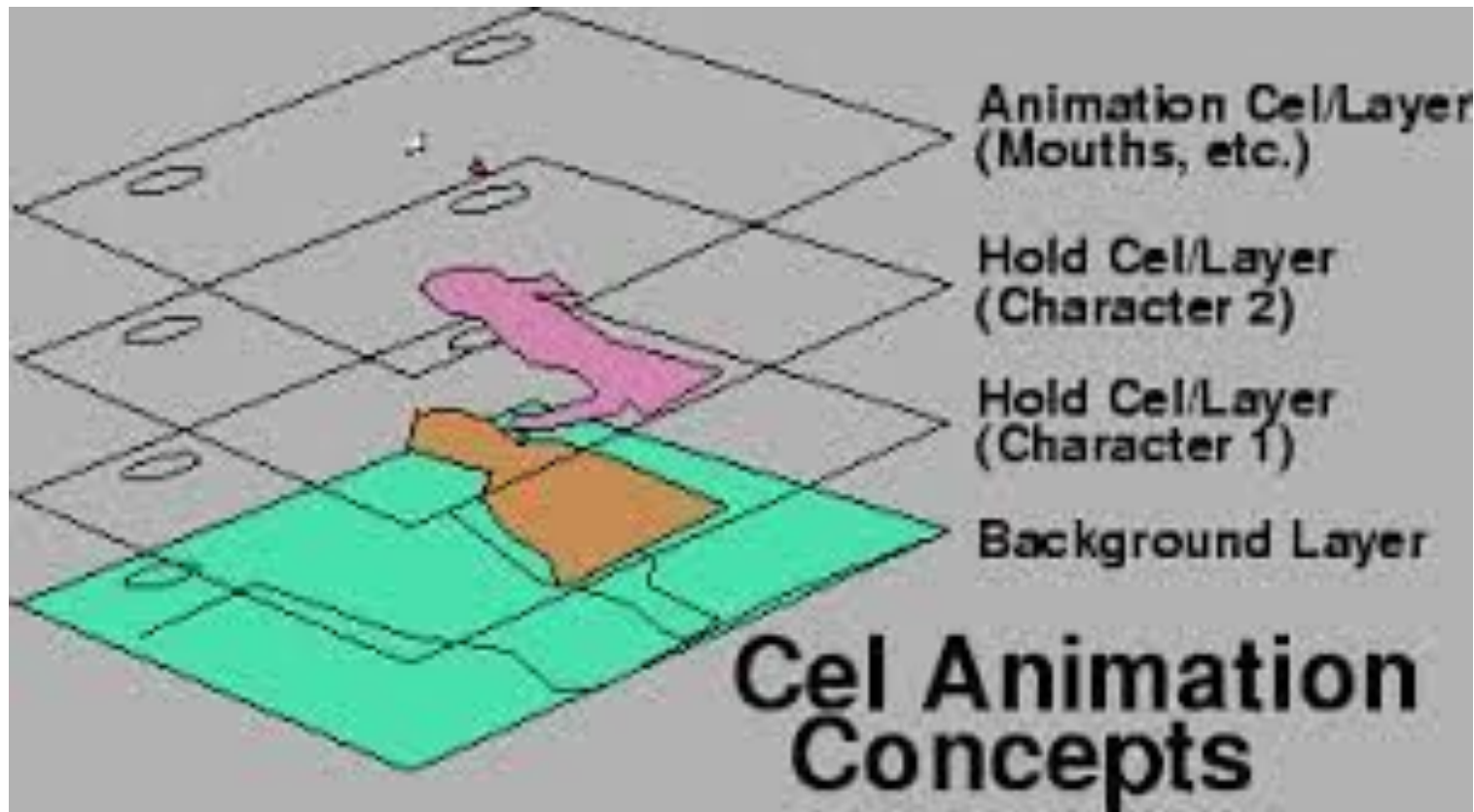


# Tipos de animação - 2D Tradicional

---



# Tipos de animação - 2D Tradicional





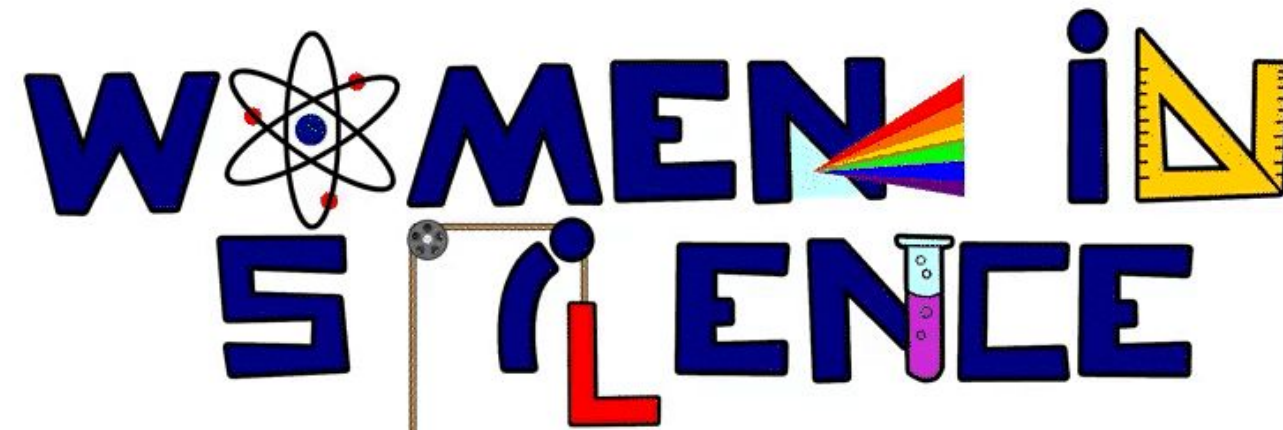
# Tipos de animação - 2D Vetorial

---



# Tipos de animação - Animação Gráfica

---





# Tipos de animação - 3D

---



# Tipos de animação - Stop Motion

---





# Expandindo - 2D Tradicional/Digital





# 2D Trad - Cada frame é uma pintura (literalmente)





# 2D Trad - Cada frame é uma pintura?

---



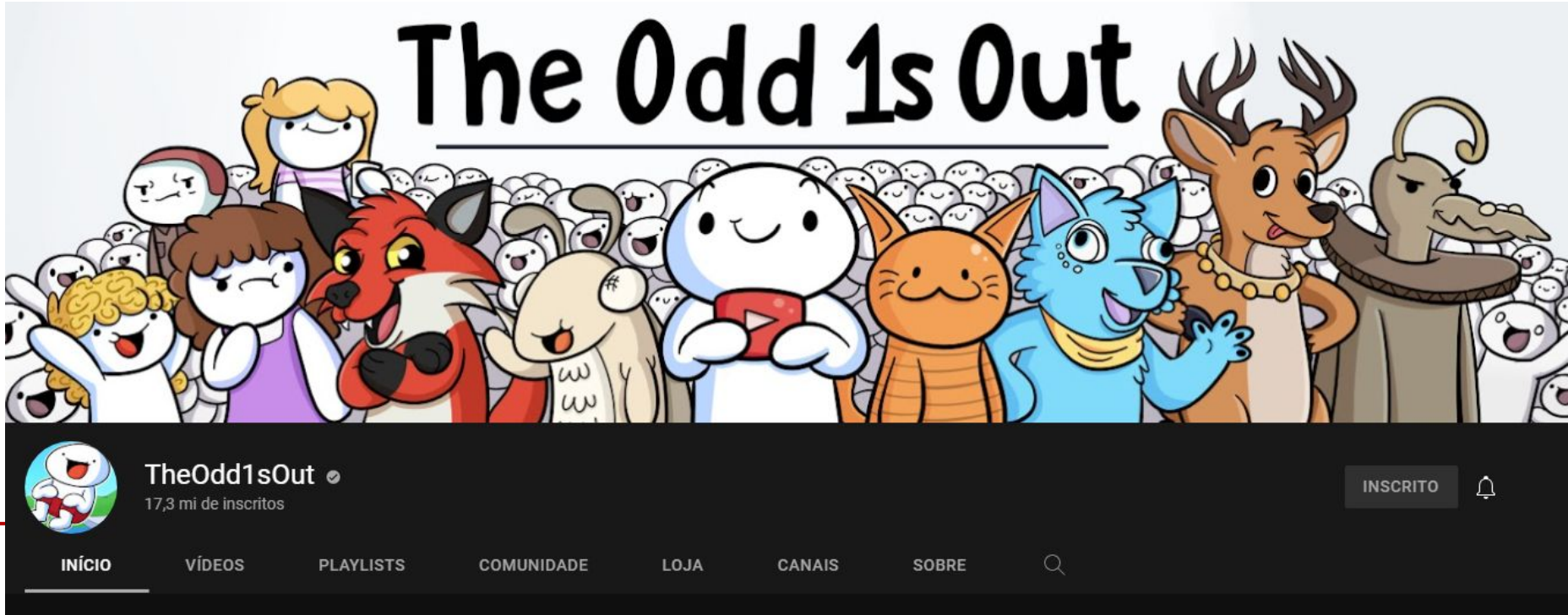
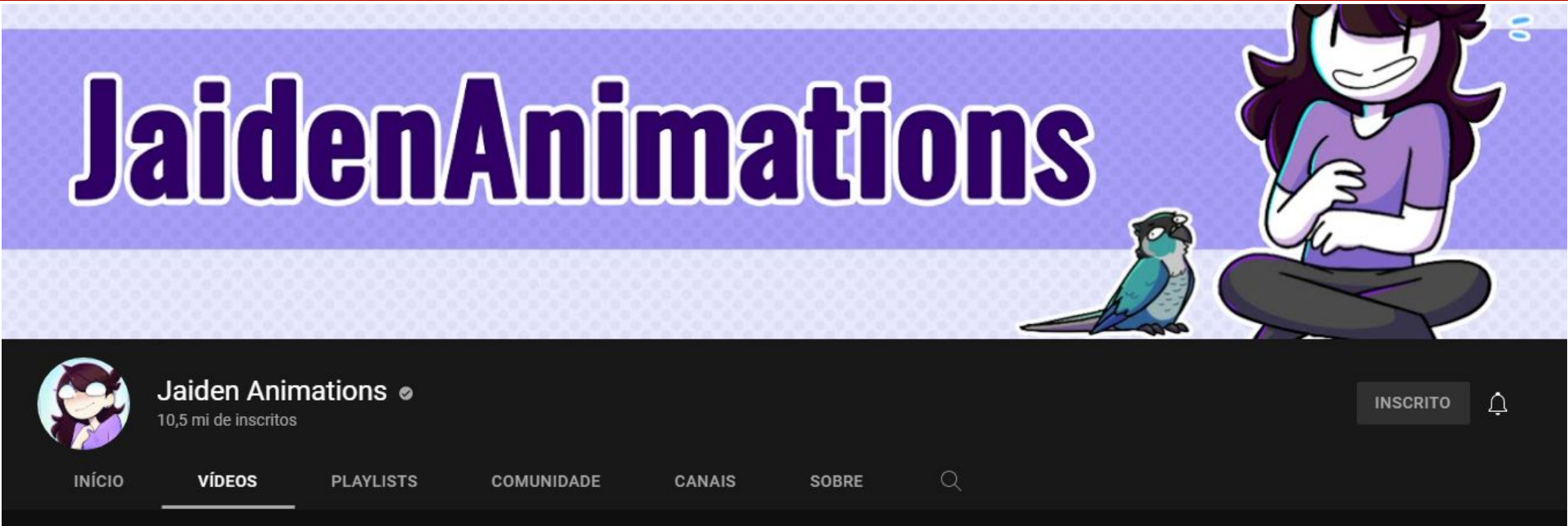
## 2D Trad - Dinâmicas ricas

---

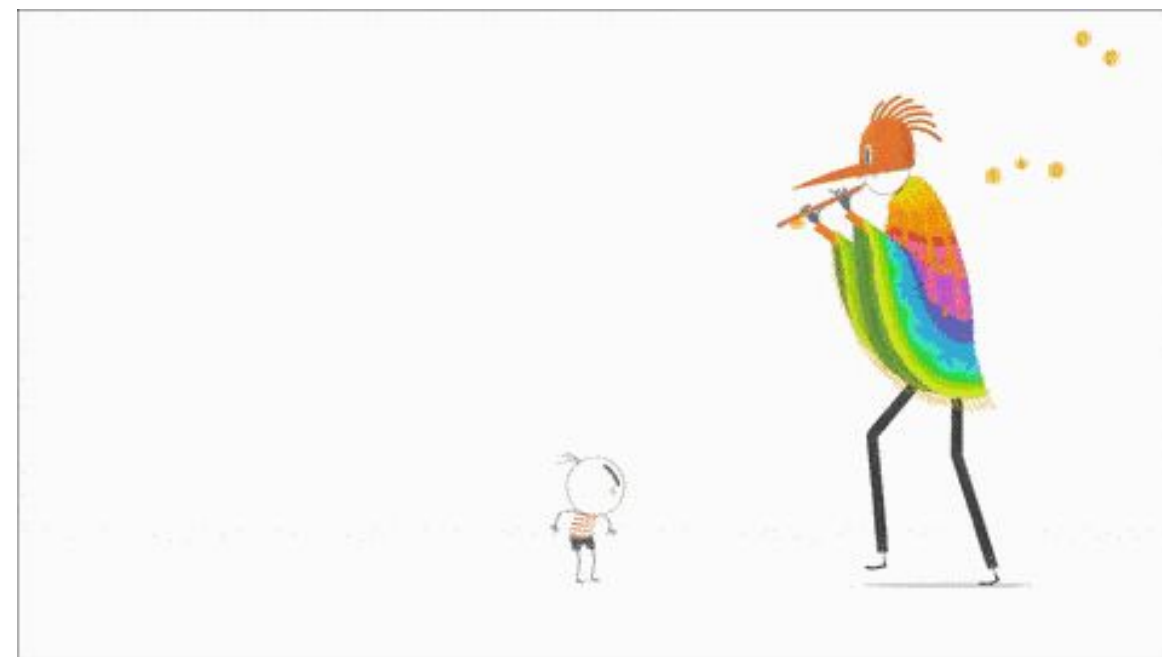




# 2D Trad - Afora



# 2D Trad



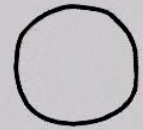


# Animando 2D Trad - Bola - Keyframes Extremos

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# Animando 2D Trad - Bola - Keyframes Secundários

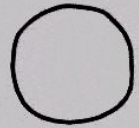
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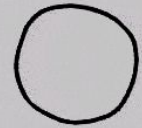
# Animando 2D Trad - Bola - Breakdowns

---



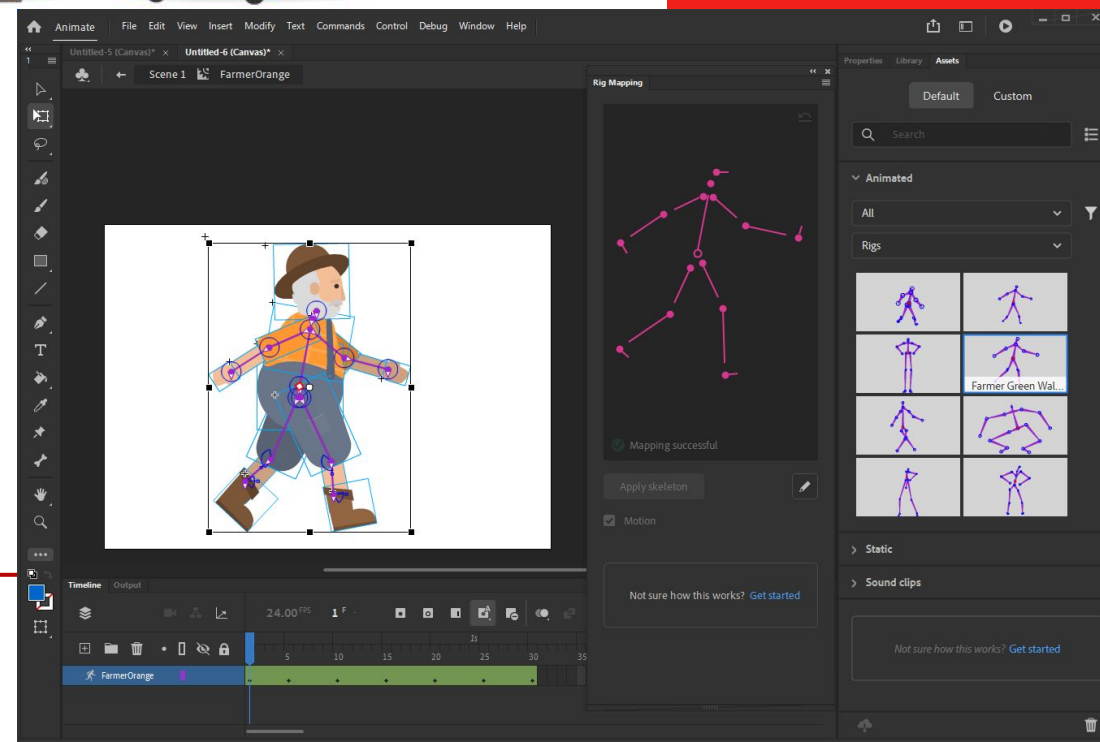
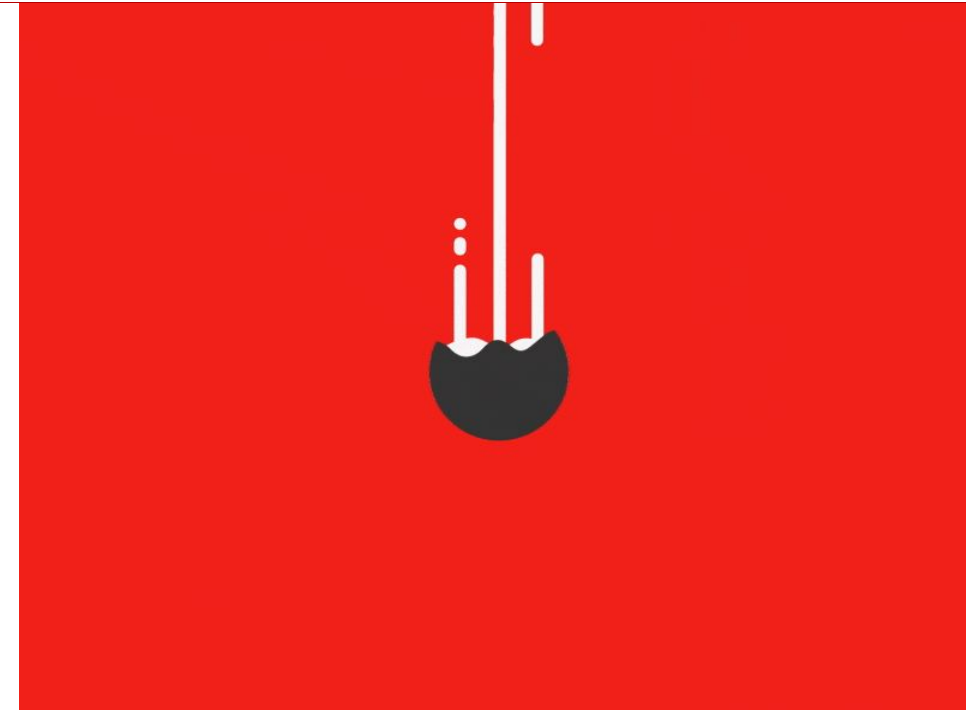
# Animando 2D Trad - Bola - Inbetweens

---

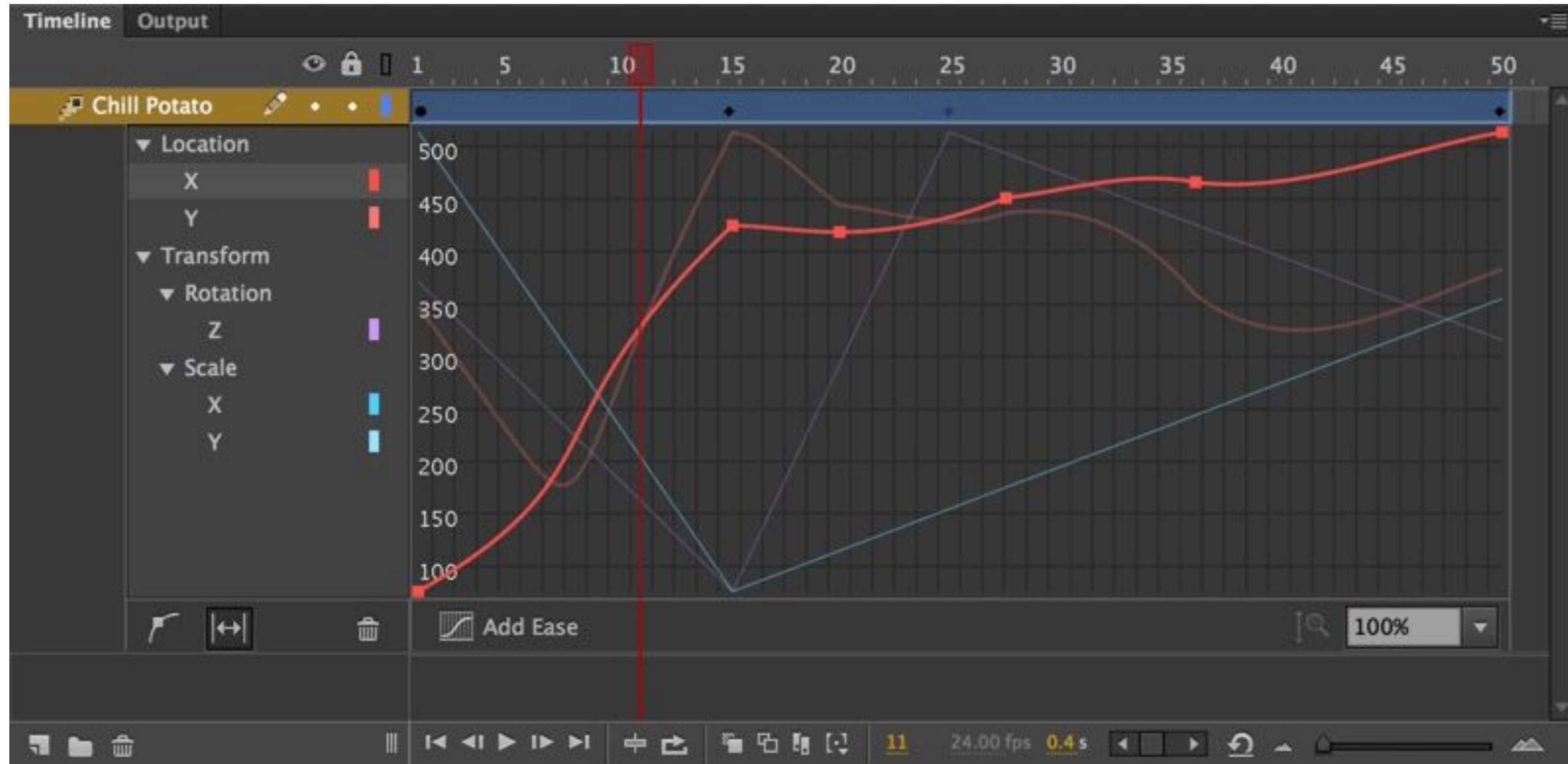




# Expandindo - 2D Vetorial e Gráfico



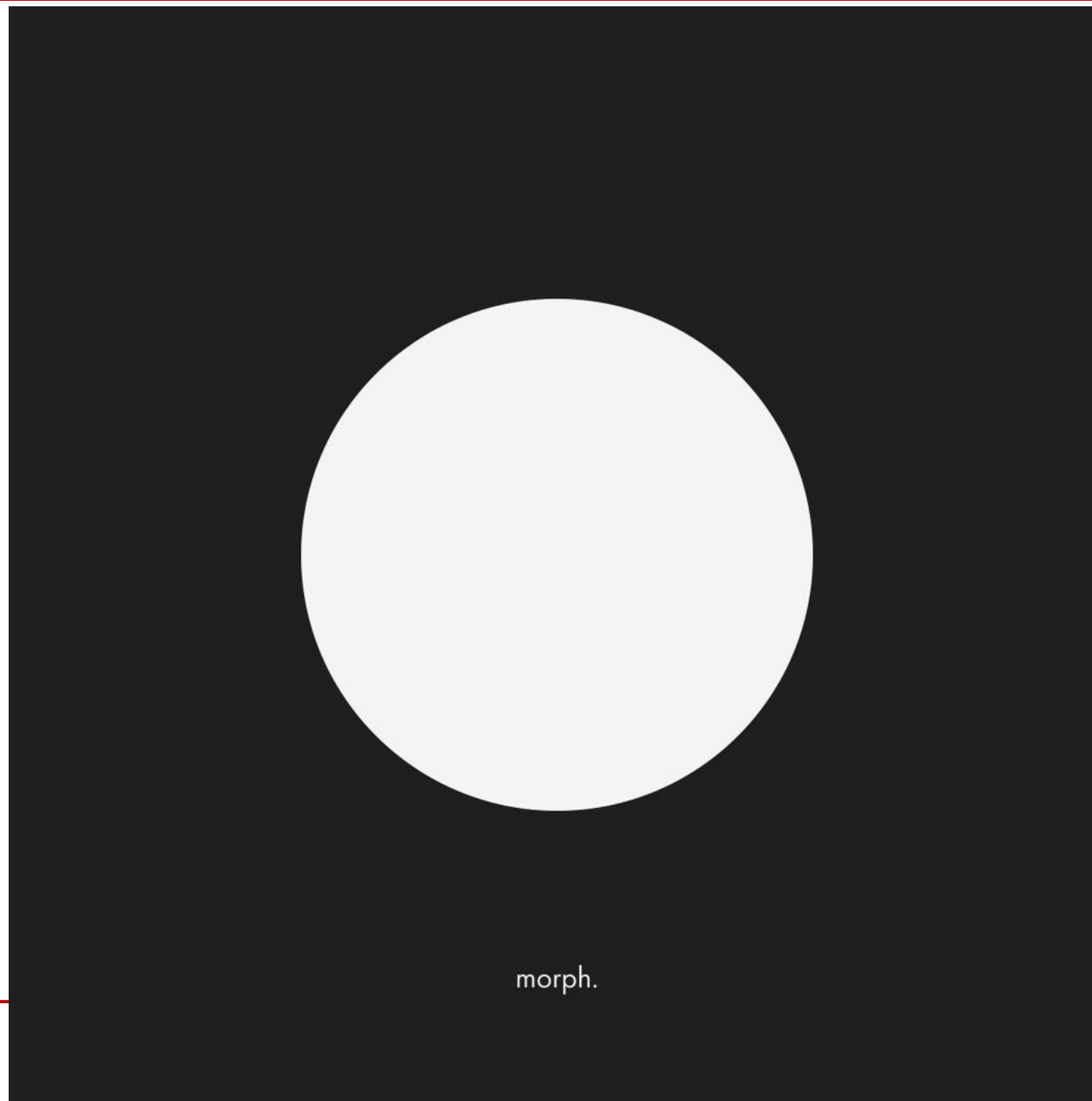
# 2D Vector - Movimento não destrutivo





# 2D Vector - Versatilidade gráfica

---



# 2D Vector - Não descarta o tradicional

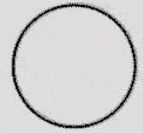
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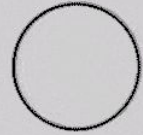


# Animando 2D Vector - Bola - Extremos

---



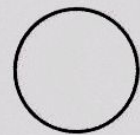
# Animando 2D Vector - Bola - Arcos





# Animando 2D Vector - Bola - Timing

---



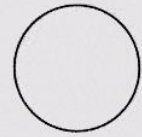
# Animando 2D Vector - Bola - Elasticidade

---





# Animando 2D Vector - Bola - Trocando Frames



# Animando 2D Vector - Bola - Elasticidade

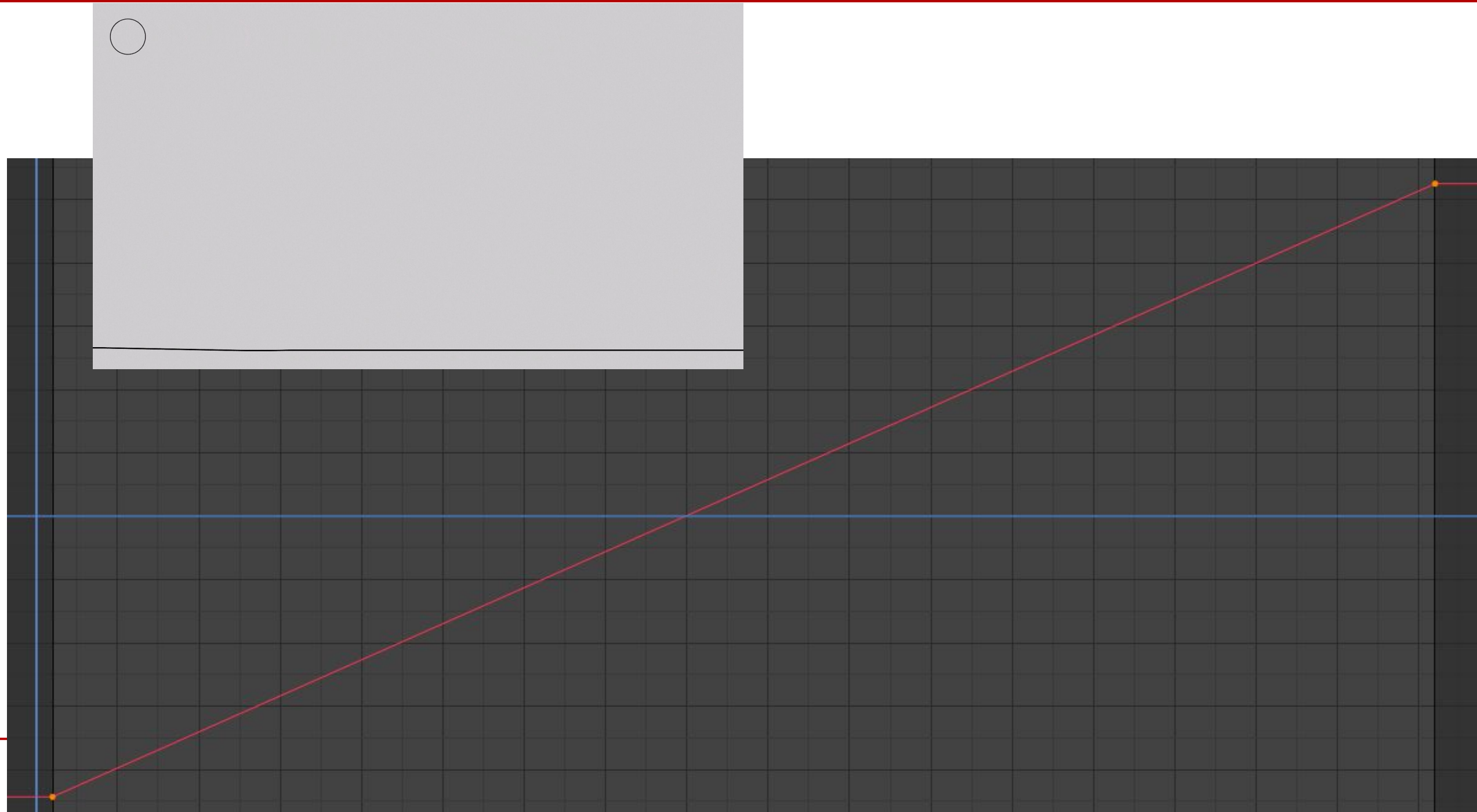
---





# Animando 2D Vector - Bola - Elasticidade

---



# Animando 2D Vector - Afora

The image shows two examples of YouTube channel banners and their corresponding channel pages. The left channel is 'Kurzgesagt – In a Nutshell', featuring a dark blue space-themed banner with a glowing globe and the text 'Quality > Quantity'. The right channel is 'Brew', featuring a light yellow banner with a coffee cup and the text 'solving mysteries.'.

**Kurzgesagt – In a Nutshell**  
16,8 mi de inscritos  
INSCRITO

**Brew**  
1,36 mi de inscritos  
INSCRITO

**THE FINAL BORDER**  
Limites VERDADEIROS Da Humanidade – A Fronteira Final Que Nunca Cruzaremos  
Kurzgesagt – In a Nutshell • 12 mi de visualizações • há 5 meses  
If you want to support kurzgesagt and get something beautiful in return check our shop: <https://bit.ly/3dRJJ71>  
Sources & further reading: <https://sites.google.com/view/sources-truelimitsofhumanity...>

**The easiest way to accidentally die**  
This is surprisingly one of the easiest way to accidentally die  
Brew • 349 mil visualizações • há 2 meses  
Install Raid for Free  Mobile and PC: <https://clik.cc/zvRcX> and get a special starter pack  Available only for the next 30 days  A barefoot misstep on the beach causing unbelievable...

The image shows the TED-Ed channel banner and page. The banner is colorful and features various cartoon characters and the text 'TED-Ed Lessons Worth Sharing'. The channel page shows the channel name 'TED-Ed' with 15,5 mi de inscritos and a list of video thumbnails.

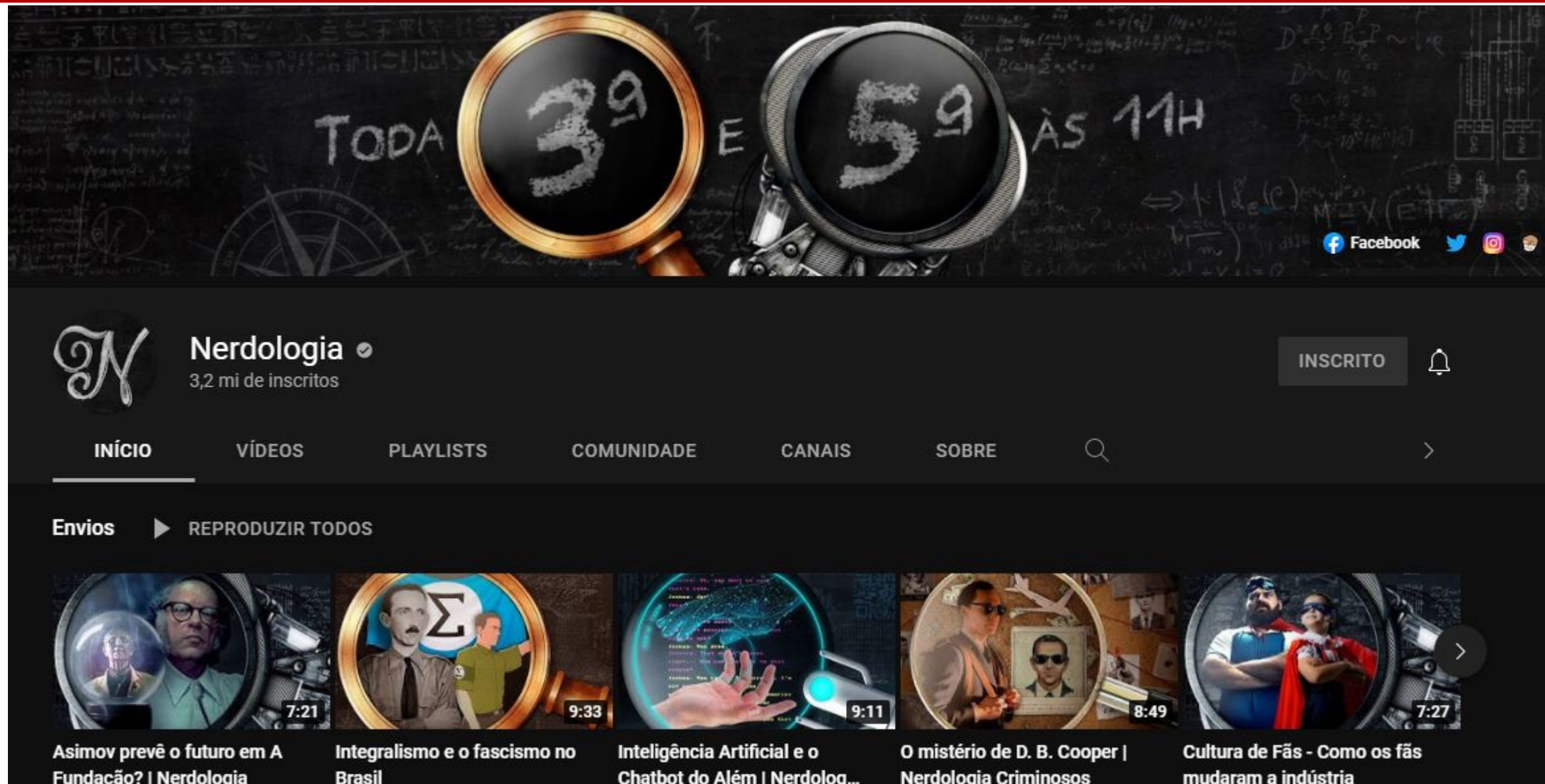
**TED-Ed**  
15,5 mi de inscritos  
INSCRITO

**New TED-Ed Originals** ▶ REPRODUZIR TODOS

- BEWARE THE INSECT INVASION!** 5:46  
Are locust plagues unstoppable? - Jeffrey A....  
TED-Ed • 260 mil visualizações • há 4 dias  
Legendas
- HOW TO GET BETTER AT VIDEO GAMES (ACCORDING TO BABIES)** 5:14  
How to get better at video games, according to babies ...  
TED-Ed • 231 mil visualizações • há 6 dias  
Legendas
- THE MYTH OF THE CURSED RING** 5:25  
MYTHIC T1 • E38  
The Norse myth that inspired "The Lord of the Rings" - ...  
TED-Ed • 774 mil visualizações
- THE SURPRISING HISTORY OF ELECTRIC CARS** 5:20  
The surprisingly long history of electric cars - Daniel...  
TED-Ed • 250 mil visualizações • há 1 semana  
Legendas
- THE SHIPWRECK CEMETERY** 4:47  
Why is this 2,500 year old shipwreck so well-preserve...  
TED-Ed • 345 mil visualizações • há 2 semanas  
Legendas



# Animando 2D Vector - Afora



The image shows a YouTube channel page for 'Nerdologia'. The header features a banner with two magnifying glasses over a chalkboard background. The left magnifying glass shows the number '39' and the right one shows '59', with the text 'TODA E ÀS 11H' around them. Social media icons for Facebook, Twitter, Instagram, and YouTube are in the top right. Below the banner is the channel name 'Nerdologia' with a verified badge and '3,2 mi de inscritos'. A navigation bar includes 'INÍCIO', 'VÍDEOS', 'PLAYLISTS', 'COMUNIDADE', 'CANAIS', and 'SOBRE'. A 'REPRODUZIR TODOS' button is visible. The video carousel shows five thumbnails with titles and durations: 'Asimov prevê o futuro em A Fundação? | Nerdologia' (7:21), 'Integralismo e o fascismo no Brasil' (9:33), 'Inteligência Artificial e o Chatbot do Além | Nerdolog...' (9:11), 'O mistério de D. B. Cooper | Nerdologia Criminosos' (8:49), and 'Cultura de Fãs - Como os fãs mudaram a indústria' (7:27).

TODA 39 E 59 ÀS 11H

Facebook Twitter Instagram YouTube

**N** **Nerdologia** ✓  
3,2 mi de inscritos

INSCRITO 🔔

INÍCIO VÍDEOS PLAYLISTS COMUNIDADE CANAIS SOBRE 🔍 >

Envios ▶ REPRODUZIR TODOS

Asimov prevê o futuro em A Fundação? | Nerdologia 7:21

Integralismo e o fascismo no Brasil 9:33

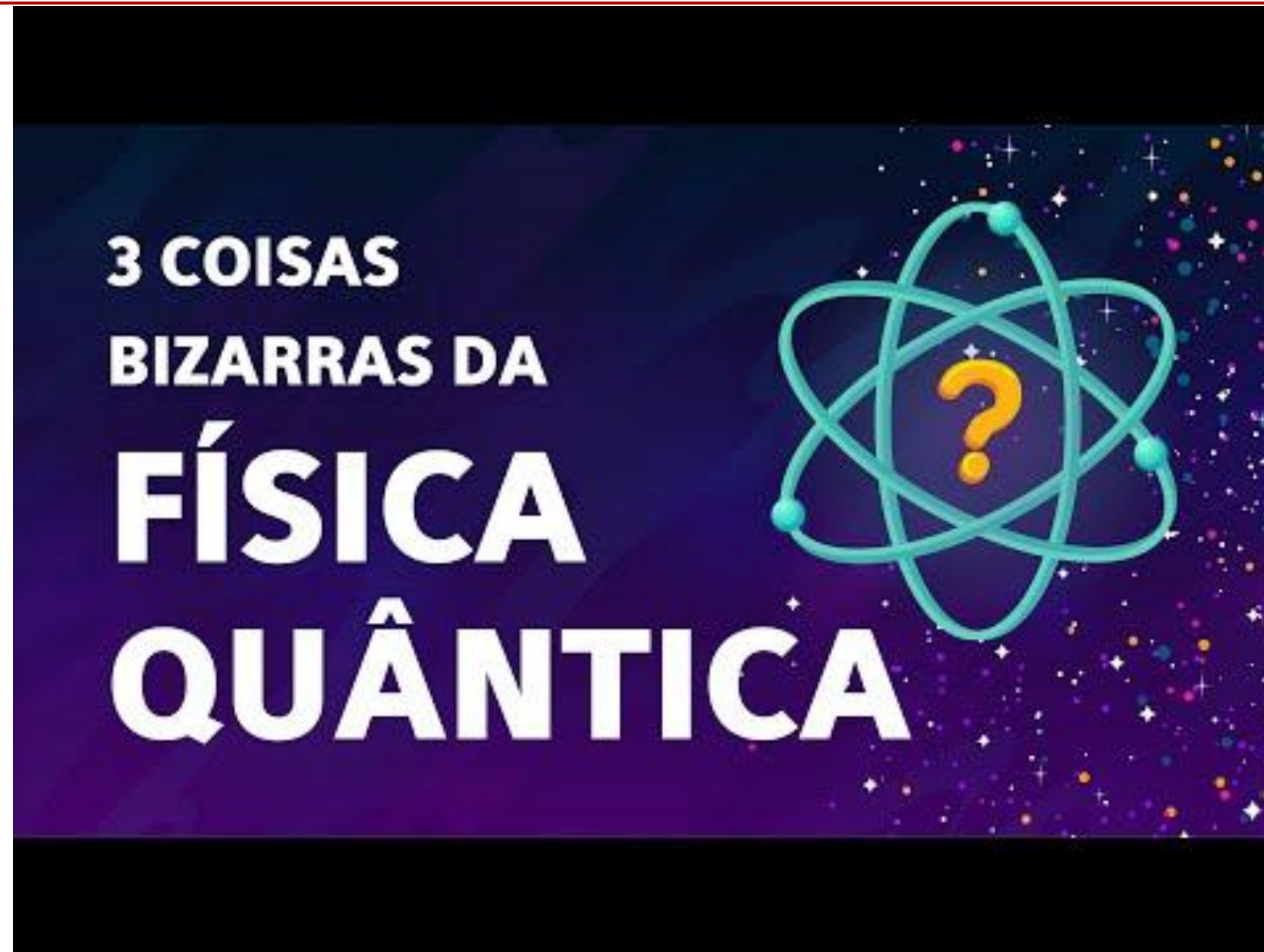
Inteligência Artificial e o Chatbot do Além | Nerdolog... 9:11

O mistério de D. B. Cooper | Nerdologia Criminosos 8:49

Cultura de Fãs - Como os fãs mudaram a indústria 7:27

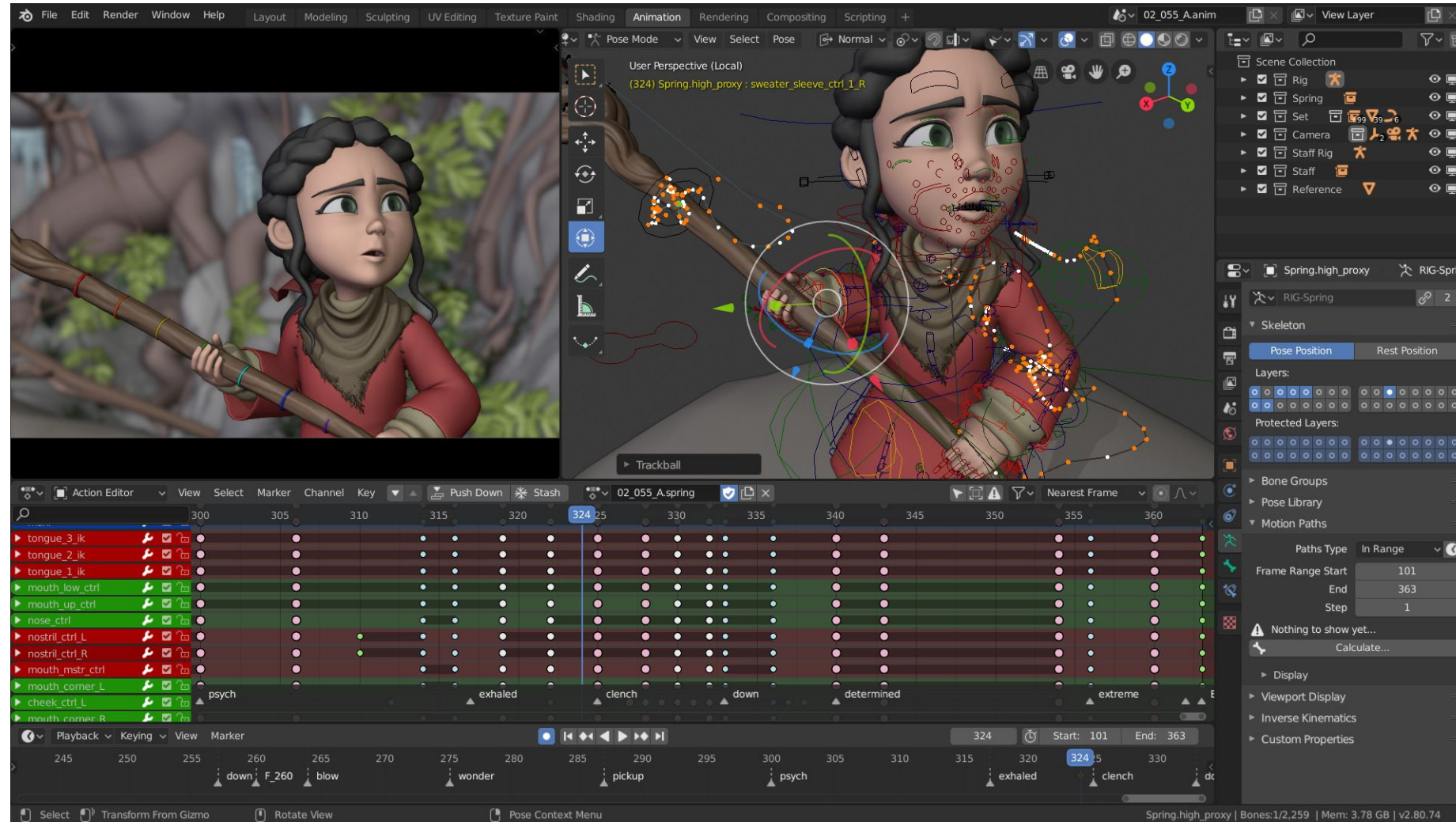
# Animando 2D Vector - Adentro?

---

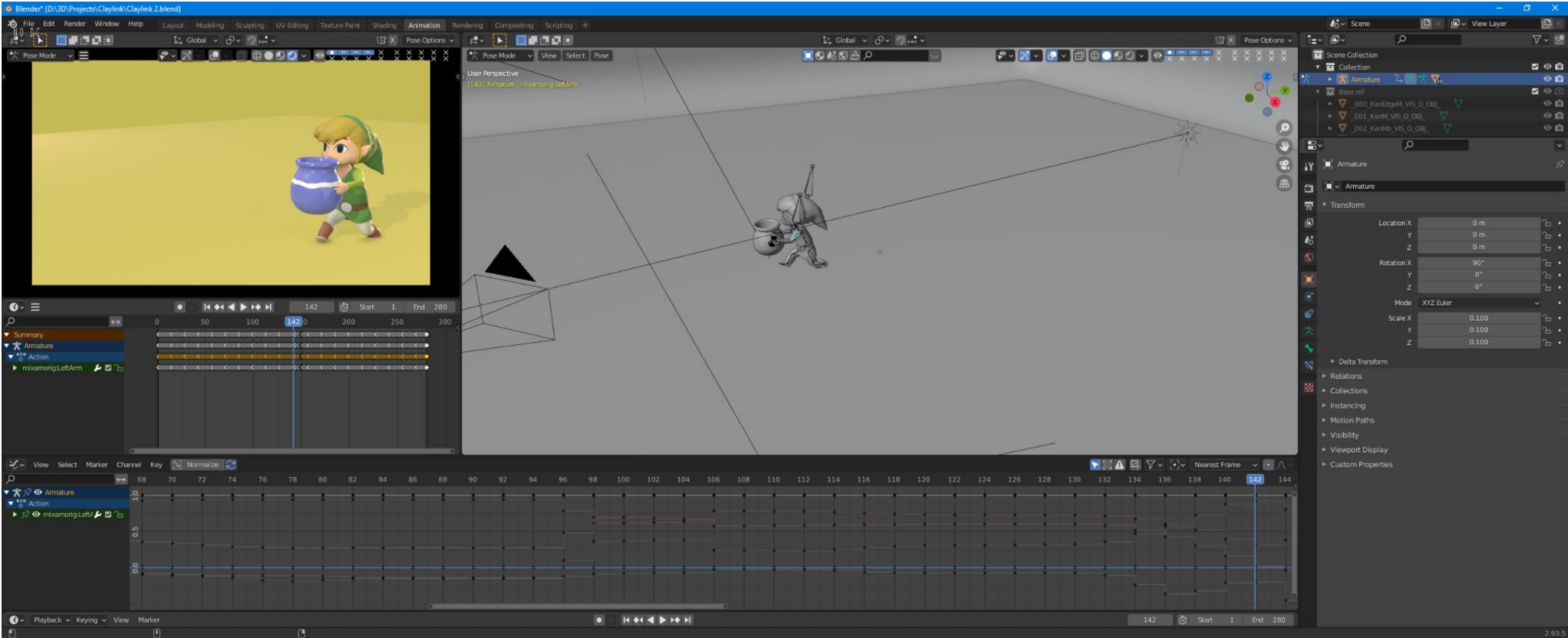




# Expandindo - 3D



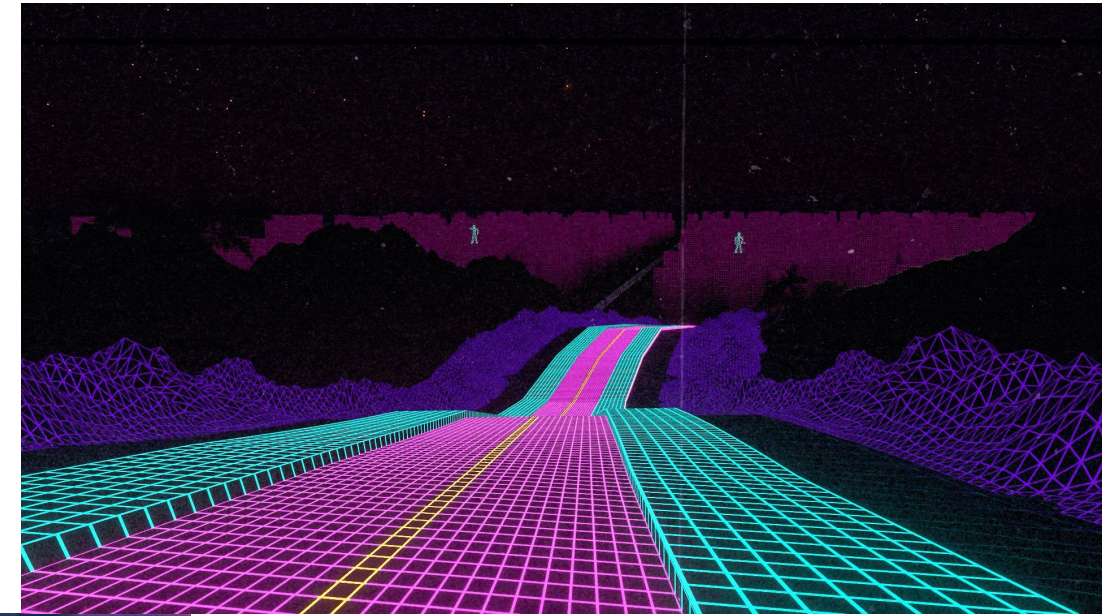
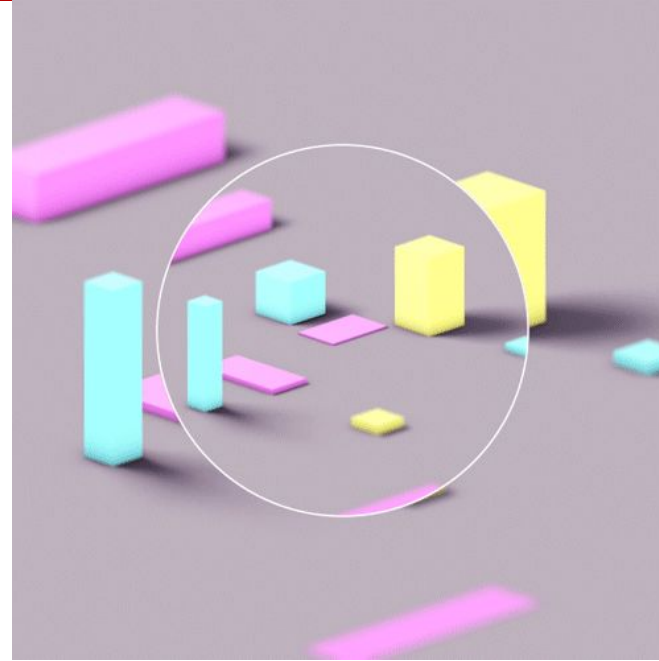
# 3D - Controle total da cena





# 3D - Muitos estilos

---



# Animando 3D - Bola - Extremos

---





# Animando 3D - Bola - Arcos

---



# Animando 3D - Bola - Rotação e timing





# Animando 3D - Bola - Elasticidade



# Animando 3D - Bola - Motion Blur?

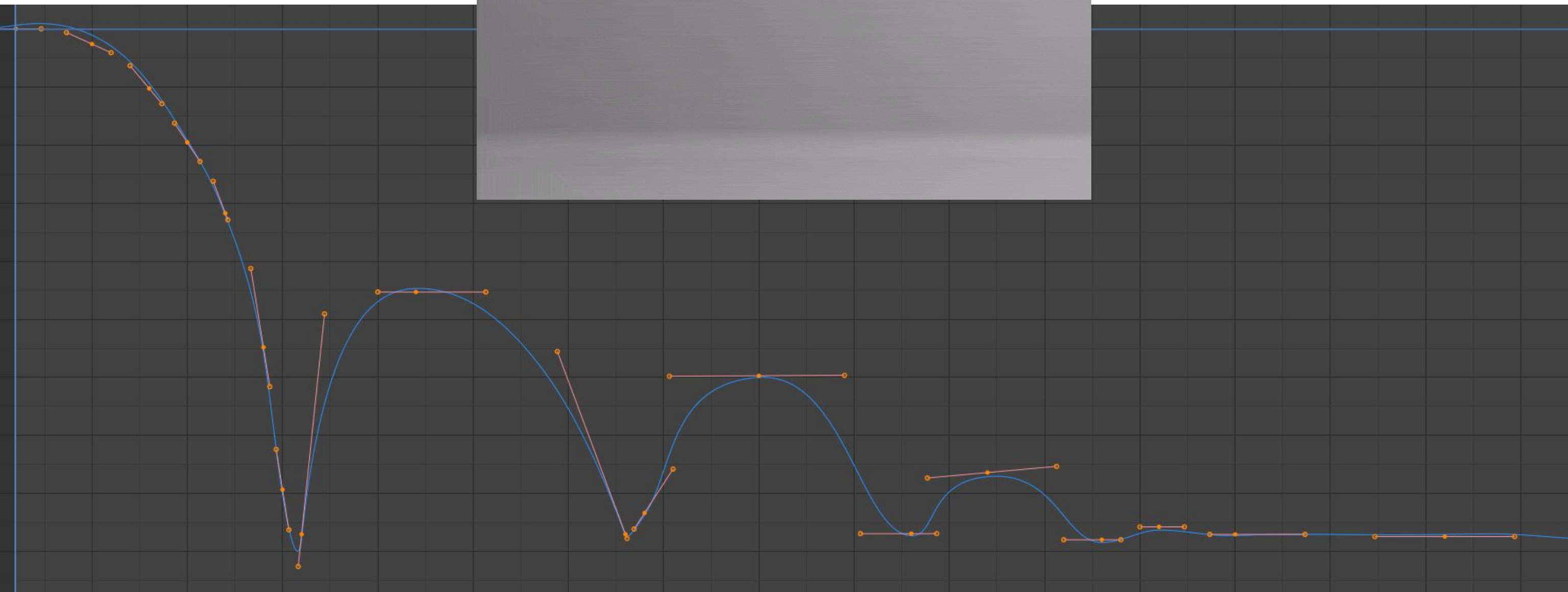
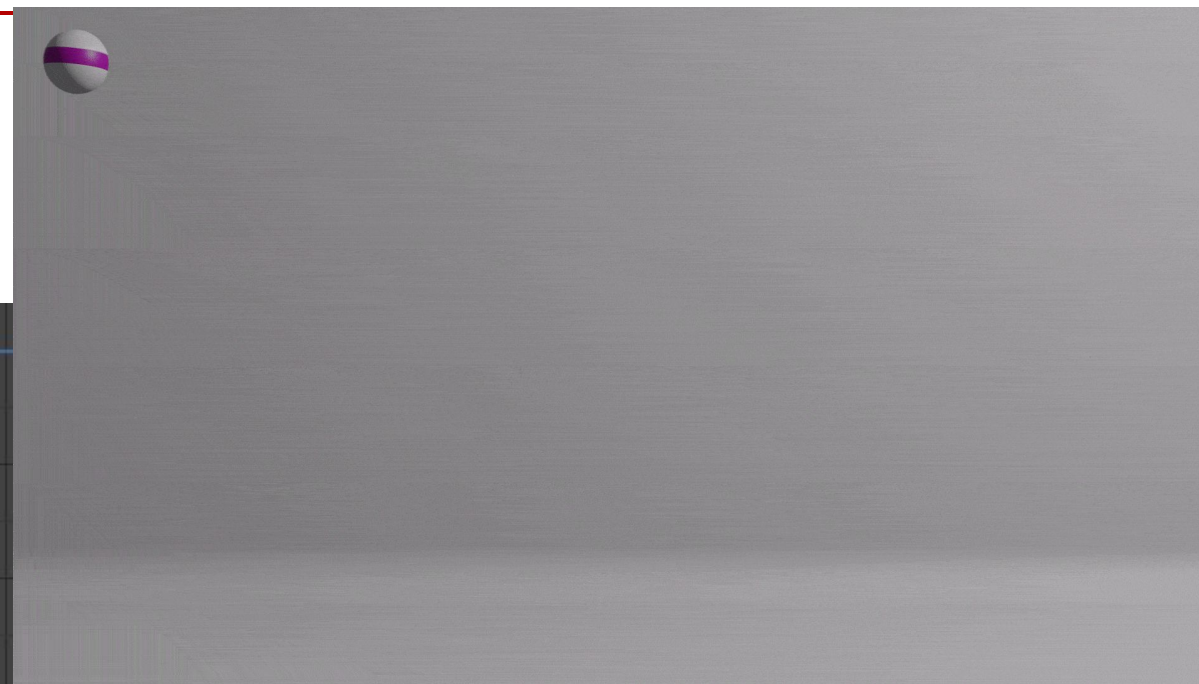
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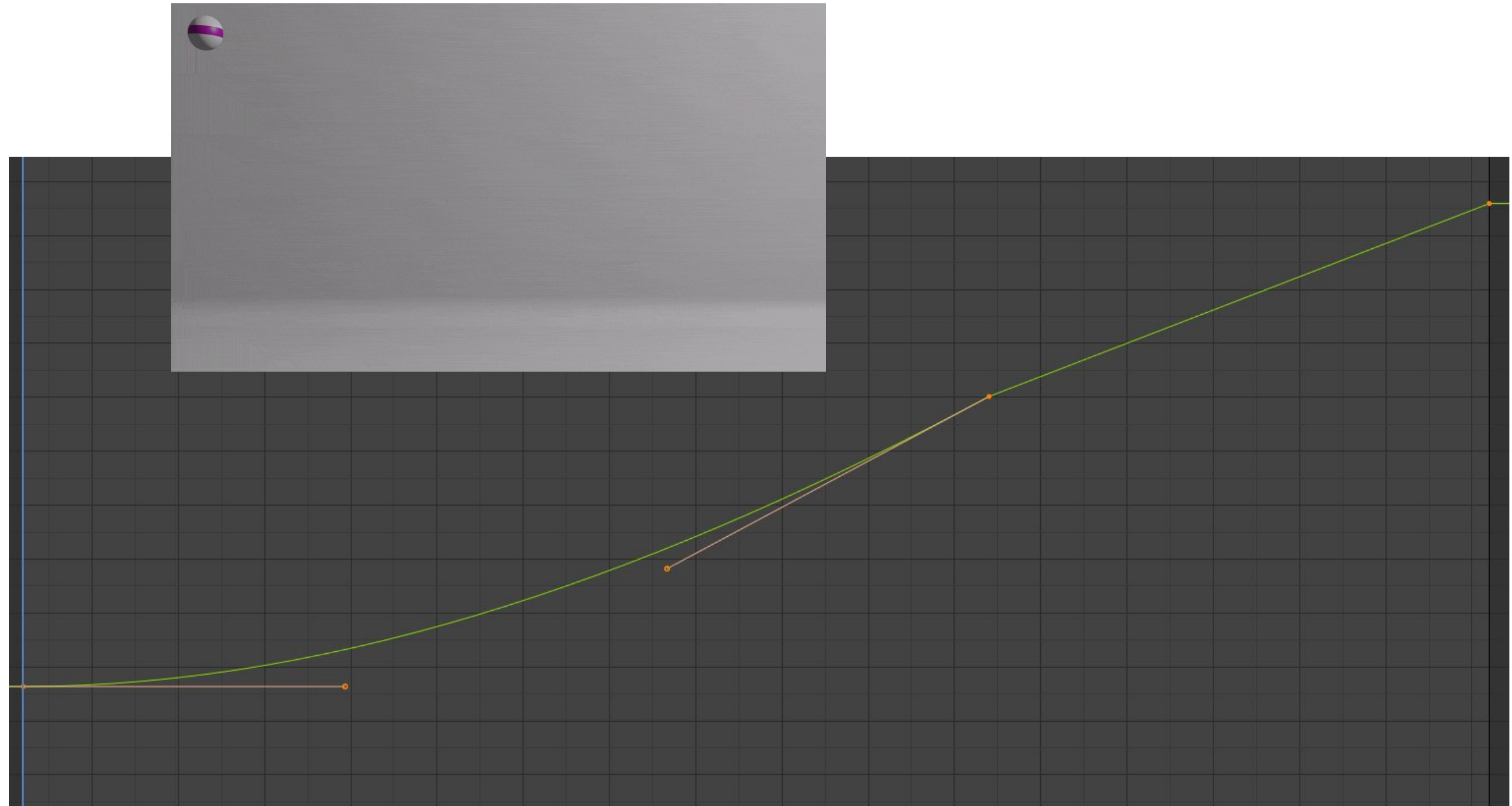
# Animando 3D - Bola - Eixo Z

---



# Animando 3D - Bola - Eixo Z

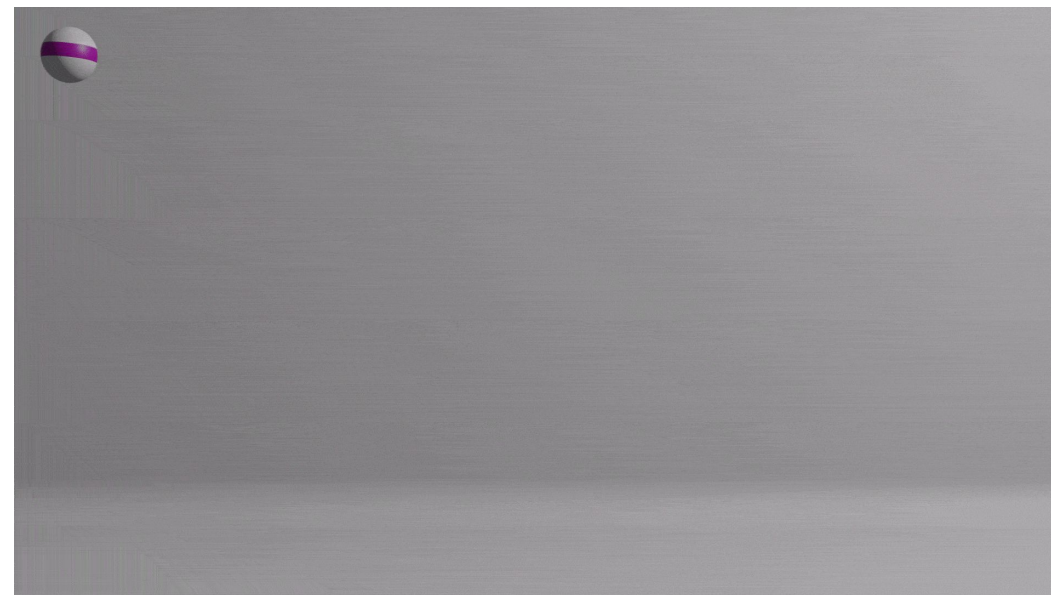
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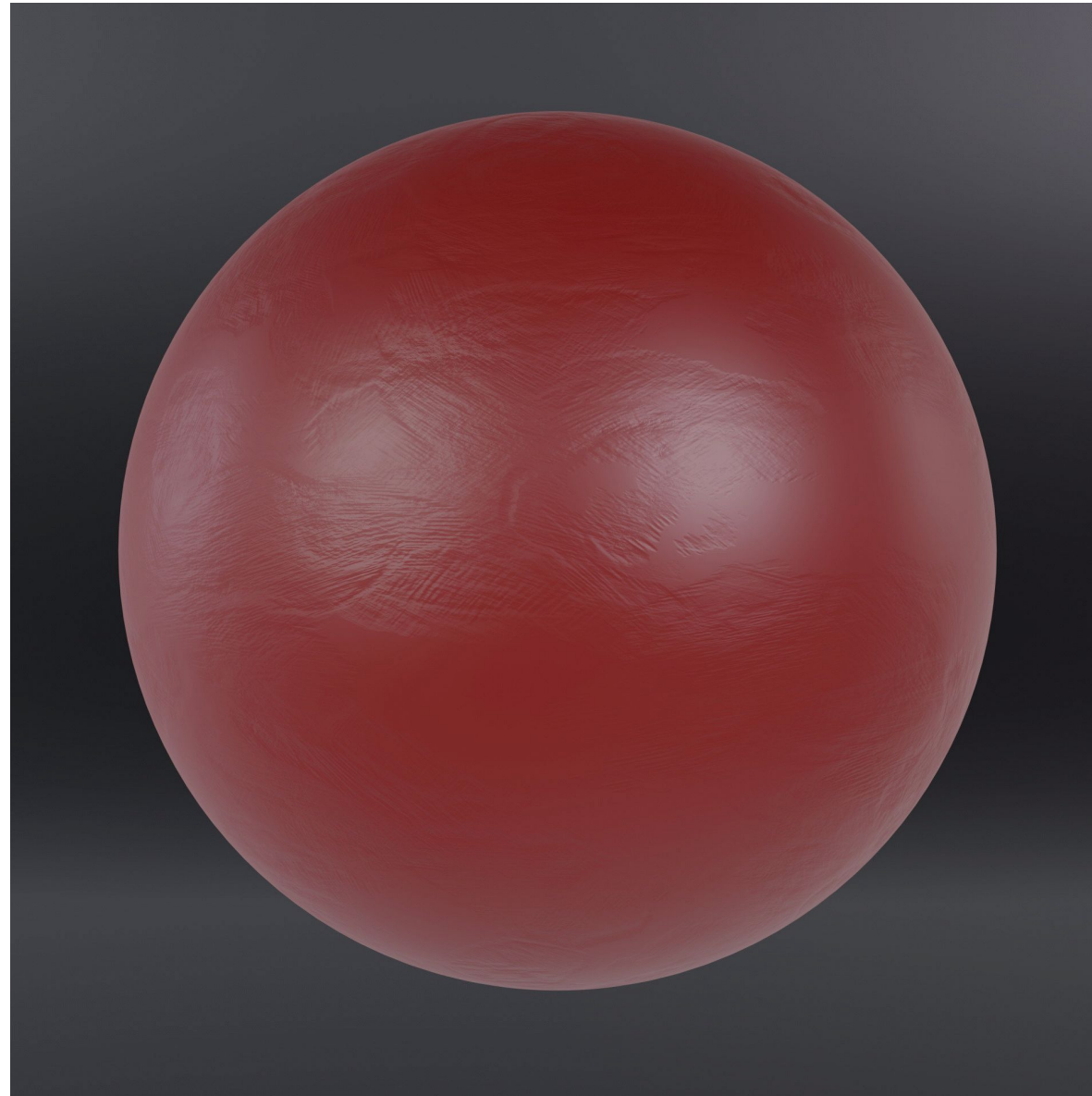
# Animando 3D - Bola

---



# Extra - Stop-Motion de mentirinha

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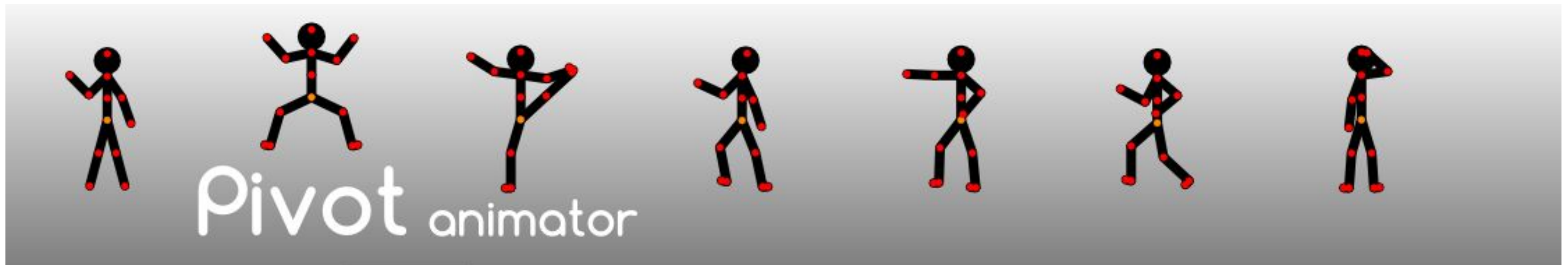
# Onde?

---



# Onde?

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